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VOL. XXXII PART 3

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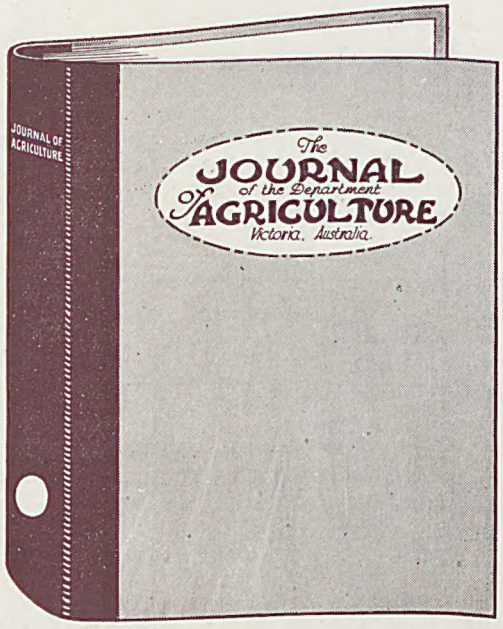

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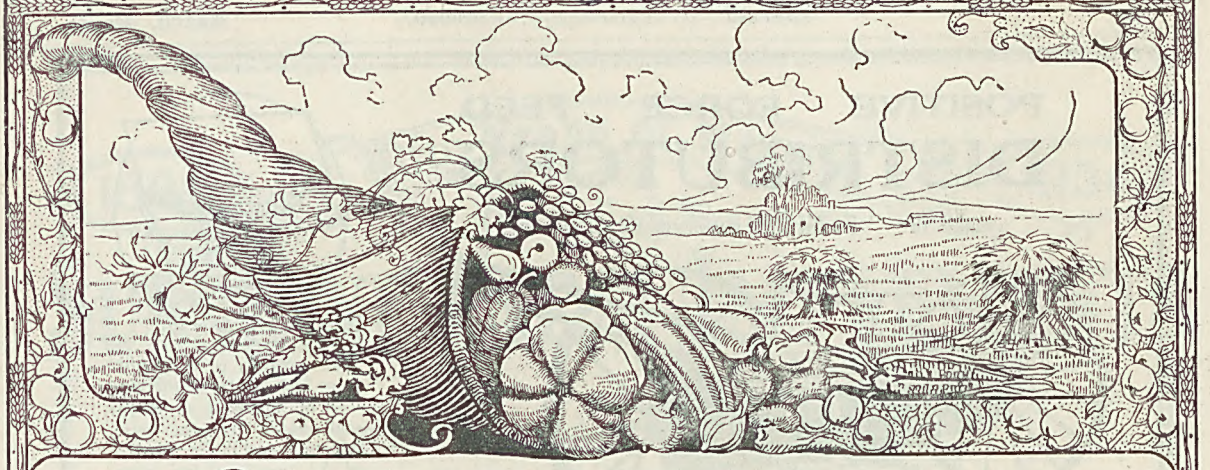

Contents.

MARCH, 1934.

		PAGE
Warragul Grasslands—Pasture and Meadow Competition	*J. E. Harrison. B.Agr.Sc.*	105
The Tobacco Crop—Topping, Suckering, Harvesting	*G. E. Coghlan*	109
Establishing New Pastures	*J. E. Harrison, B.Agr.Sc.*	111
Potato Growing in Victoria—Inter-cultivation	*J. T. Ramsay*	114
Replacements Necessary in the Dairy Herd	*A. C. T. Hewitt, M.Agr.Sc.*	118
Common Colics of the Horse	*R. N. Wardle, B. V.Sc.*	121
Cereal Trials 1933—Results at Longerenong and Dookie		128
Stanhope Lucerne Competition	*J. Barrett and E. T. Beruldsen, B.Sc. (Agr.)*	131
Orchard and Garden Notes	*E. E. Pescott, F.L.S.*	133
Professional Paper—		
The Green Peach Aphid—Part 2	*Keighley M. Ward, B.Agr.Sc.*	134
Standard Herd Records—Quarter ended 31st December, 1933		146

Issued under the direction of the Hon. J. Allan, M.L.A., Minister of Agriculture.

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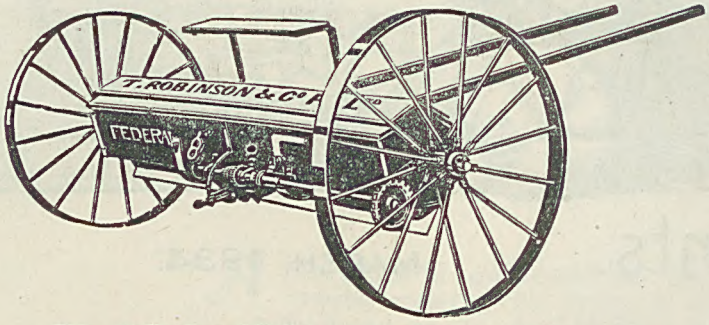

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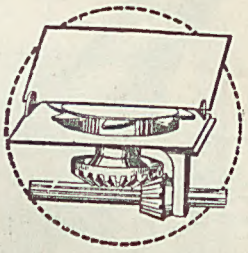

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INDEX TO ADVERTISEMENTS

FRONT SECTION

Australian Cement Ltd. v

Commonwealth Fertilizers & Chemicals Ltd. x

C.O.R. Power Kerosene vi

Dunlop Perdriau Rubber Co. Ltd. ... viii

Gippsland & Northern Co-operative Coy. Ltd. (Separators) v

International Harvester Coy. of Australia Ltd. vii

H. V. McKay-Massey Harris Pty. Ltd. ... iii

Robinson, T., & Coy. Pty. Ltd. ii

Vacuum Oil Co. Pty. Ltd. iv

BACK SECTION

Cameron, Sutherland & Seward Pty. Ltd. .. xviii

Dookie and Longerenong Seed Wheat ... xii

Friesian Calves for Sale xix

Gippsland & Northern Co-operative Coy. Ltd. (Seeds) xiv

Lysaght Bros. & Coy. Ltd. xviii

Red Poll Calves for Sale xvi

Rylands Bros. (Aust.) Ltd. xi

Sheep Bulletin xv

Shell Coy. of Australia Ltd. xi

State Savings Bank xii

Trewhella Bros. Pty. Ltd. xiv

Victorian Dried Fruits Board ... ... cover

Victorian Railways xiii

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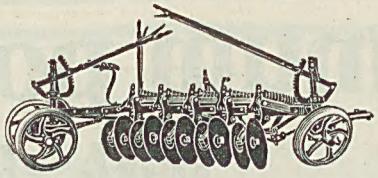

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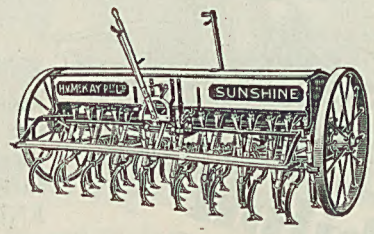

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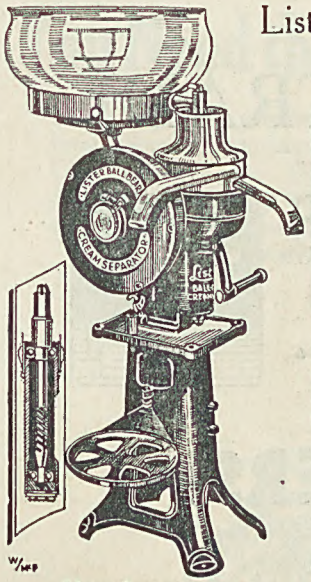

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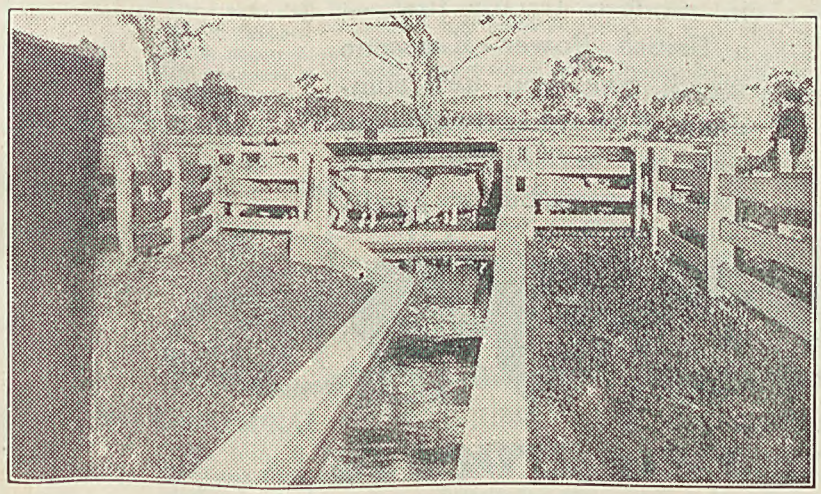

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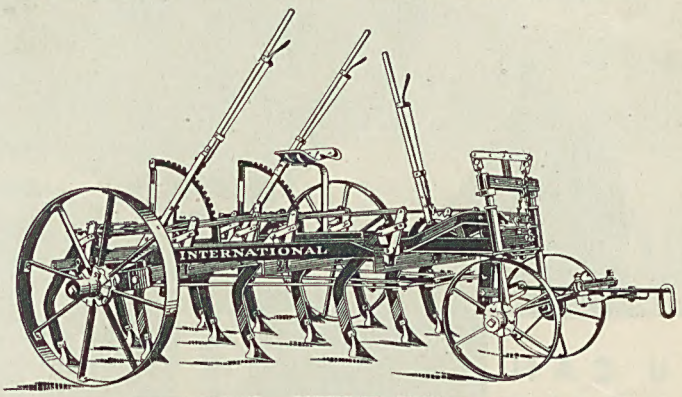

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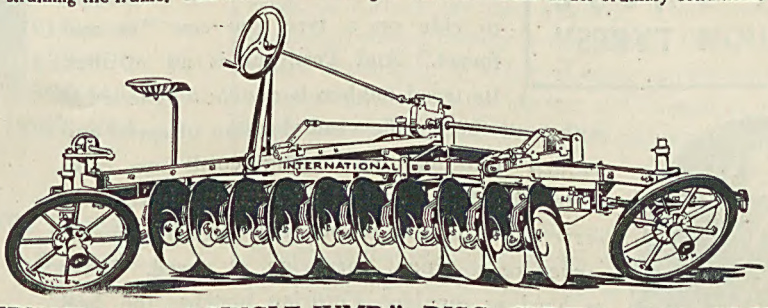

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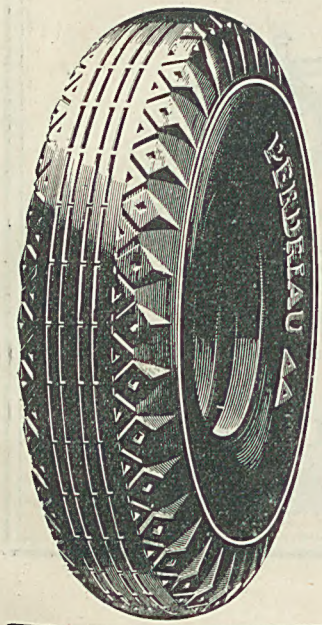

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Warragul Grasslands

Pasture and Meadow Competition

Report of the Judge, J. E. Harrison, B.Agr. Sc., Senior Agrostologist

IT is apparent to an observer visiting the Warragul district each year that improvements are taking place on practically every farm. Subdivision has been undertaken by many farmers and many new fences are to be seen in the district. One would hestitate to recommend intensive subdivision, however, until local experience fully confirms its value. It is suggested that a policy of progressive development based on experience from year to year would lead to the best results. A complete plan of subdivision may well be drawn up to commence with, but it would seem wise to test its advantages before putting the plan completely into operation. Once it is shown to be economic and convenient, and as resulting in a profitable increase in the productive capacity of the farm, the system can then be applied with more confidence.

There are definite benefits to be derived if pastures are grazed in rotation, and moderate subdivision may confidently be recommended, but more experience is yet wanted before intensive subdivision may be widely advocated under Victorian conditions.

The majority of entries in the Pasture Competition came from the flats, where the dry early spring had not been severely felt—in fact conditions appeared to have been favorable to the pastures. It was noticeable that strawberry clover was more advanced than usual at the time of judging and pastures containing this plant showed to better advantage than in some previous years. The Darnum flats were enjoying an excellent season, and very few points separated a number of pastures on this area. It was thought that more exhibits might have come from the chocolate soils however with reasonable hope of bearing favorable comparison.

First prize in the pasture competition went to the "creek paddock" exhibited by Messrs. J. F. Keating and Sons—an old rich pasture on highly fertile land. Rye grass, white and strawberry clover were abundant, and formed the sole of a dense and luxuriant sward. A little fog was apparent and an odd thistle was discovered, but the general appearance of the pasture was excellent. It had been top-dressed with a bag of superphosphate per acre and harrowed in the previous autumn. Rotational grazing is practised on the farm and the competition field was next to be grazed at the time of inspection. It looked a thoroughly sound, well managed pasture.

Messrs. J. F. Young and Sons exhibited a very good pasture, a section of a large field which had been top-dressed with 1 cwt. of superphosphate per acre and harrowed in the autumn. It contained rye grass, white and strawberry clover, with an admixture of fog and rib grass. A harrowing in late winter or early spring would have improved its appearance, but it was attractive and in good heart and finished close in second place with 93 points.

Mr. S. Adkins showed a small home-paddock, well sheltered and well cared for, in which good treatment over many years had built up a very good pasture. It had been top-dressed with a bag of superphosphate per acre in June and moderately grazed throughout the year. Rye grass, white and subterranean clover predominated, a few annual grasses and a little rib grass being present as well. It was a clean and attractive pasture, in which weeding and spreading of manure had been done at every opportunity. Mr. Adkins was awarded 92 points.

An interesting point was brought under notice in Mr. J. F. Young's pasture, a typical field on the Darnum flats, which carried mainly perennial rye grass, fog grass, white and strawberry clover. The pasture had been down seven years, and though subterranean clover made an early appearance in one corner, Mr. Young had observed that it had largely given way to white clover, a perennial species which continued to grow after the death of the subterranean clover each year and so got possession of the land. Plant species universally become dominant in those situations which suit them. The natural conditions of rainfall, soil and situation perhaps play the most important part, but it must be recognized that the method of grazing adopted may also be a determining factor, and the observant farmer will learn much of interest and importance if he watches the effects of grazing upon the different species in his pastures.

Topdressing.

Every field exhibited in either the Meadow Competition or the Pasture Competition had been top-dressed during the year. In most cases indeed the fields had been top-dressed for several previous years. This recognition by farmers that their best fields are those which have been top-dressed is eloquent evidence of the effects and value of the practice.

Even on the Darnum flats, famous for their fertility, the results of top-dressing are noteworthy. Mr. J. F. Young, whose farm occupies typical Darnum country, states that top-dressing has increased his carrying capacity by 15 cows on 80 acres at an annual cost of £16 for manure, or £1 1s. 4d. per cow.

In the Warragul district the quantity of superphosphate applied varies from 1 cwt. to a bag (187 lb.) per acre. In some outstanding cases manure is applied annually to every acre of the farm and pastures of unusual quality have steadily developed.

Early application of superphosphate as soon as growth commences in the autumn is another phase of the practice of top-dressing which is gaining many adherents. This is the period when the phosphate requirement of young plants is greatest and there is a steadily increasing belief that early application of superphosphate leads to an increased response from the pasture especially throughout the autumn and winter, when growth is normally at its lowest.

Awards in the pasture competition are set out in Table I.

TABLE I.—AWARDS: WARRAGUL PASTURE COMPETITION.

Name.	Composition.	Denseness.	Management.	General Appearance.	Freedom from Weeds.	Total.
Possible points	**35**	**15**	**25**	**15**	**10**	**100**
Keating, J. F. and Sons (Creek Paddock) ..	34	15	24	14	9	96
Young, J. F. and Sons ..	34	15	22	13	9	93
Adkins, S.	34	14	21	14	9	92
Gaul, W.	34	14	22	12	9	91
Keating, J. F. and Sons (Windmill Paddock) ..	34	14	23	11	9	91
Manley, G.	34	13	23	12	9	91
Young, J. F.	33	14	23	11	9	90
Gaul, S.	34	14	21	11	9	89
Sutherland, D. ..	31	12	23	11	10	87
Ashcroft, W.	30	11	20	10	10	81
Stoll, H. F.	33	11	18	8	9	79

MEADOW COMPETITION.

Since the inception of the Meadow Competition in 1928, good and poor seasons appear to have alternated quite regularly. The year 1928 was an exceptionally good one and farmers still speak of it as the best subterranean clover year ever experienced. This last season, 1933, will probably be remembered as one of the poorest, though it should be stated in qualification that the clover nevertheless contributed the bulk of the yield in fields where the plants formed the usual dense stand in combination with grasses. The relatively dry autumn and early spring particularly affected clover growth, and in fields where clover had become well established in the past, it showed up poorly last spring.

A stack of meadow hay.

It is an ill wind however that blows nobody good, and last year was favorable for the flats. In seasons of heavy rainfall these areas are inclined to be too wet for best growth in winter and early spring and if moderate rainfall prevails, more favorable conditions are experienced. The moderately dry winter of 1933 favoured the flats and the spring rains were sufficient to maintain excellent growth.

By comparison the hill country was having a poor season, though actually the pastures and crops were in very fair heart—much better really than general opinion conveyed. The luxuriant growth of some previous years had not taken place, but well managed pastures and crops were carrying a lot of feed.

It is suggested that species or strains with a considerably longer growing period than at present employed might be used for hay purposes in the Warragul district. Meadow hay is cut from about the third week of November onwards, that is, about the middle of spring, when good rains are still expected and satisfactory conditions prevail for the continued growth of crops, meadows and pastures. At present hay making takes place when conditions are difficult, and later maturing species and strains than those at present employed could be harvested at a time when less rain is expected and when temperatures are higher and better drying conditions prevail.

Mr. G. R. Jones, who gained first place with 86 points exhibited a crop of very good quality, clean and uniform. Superphosphate had been applied at the rate of eight bags on seven acres in August. Farmyard manure also had been applied, and the result of this liberal treatment was apparent, the field being in great heart and carrying a lot of feed. Rye grass, cocksfoot and subterranean clover, comprised the bulk of the yield, a little rib grass, and goose grass being present, but in small proportion.

It was interesting to meet a farmer who was making systematic use of farmyard manure. In Europe, where cattle are stall fed during winter, farmyard manure accumulates in great quantity and is regularly applied to the fields each winter. Though much less is available for use on Victorian farms, it is good husbandry to store it as well as possible and make full use of its manurial value. Mr. Jones is very consistent in exhibiting fields of high quality and is to be complimented on securing first place.

Mr. J. F. Young secured second place with 84 points for his green succulent crop, which was well cared for, clean and of very good quality. The field had been top-dressed and harrowed in early spring and closed during the first week of October. Rye grass, white and strawberry clover, were the principal species, mixed with a proportion of fog grass and sweet vernal. A little creeping butter-cup, a weed disposed to find a place on the rich flats of the district was noticed. Mr. Young was justly proud of his exhibit, which had been carefully prepared. It had responded with a luxuriant growth and promised a good yield.

Mr. G. Manley is another consistent exhibitor who has deservedly gained a place on several occasions. His exhibit this year was again a good one, being well grown and dense, with a few weeks to run before being ready to harvest. The rye grass and cocksfoot had not yet run to ear and were in nice proportion to the subterranean clover, which had made exceptionally good growth for the season. A little dandelion and rib grass were present. The field looked very attractive apart from one weak spot, due to soil variation, and promised a good yield. It had been top-dressed with one bag of superphosphate per acre in the autumn and closed on 8th October.

An interesting exhibit was that of Mr. W. J. Bingham. This was a field which had been entered the previous year, and had cut an exceptionally heavy crop. It was much weaker this year, and it may be noted that on a previous occasion, a very heavy field, exhibited by Mr. W. Carr, was weak the next season. In both cases weeds had come in in the second year. These results support the general opinion that a very heavy hay crop tends to open up a sward. It would apparently be best to nurse a field as a pasture for a few years in such a case and gradually bring it back into condition again.

Another observation of interest was the occurrence of Italian rye grass on a field 12 years old on the property of Mr. W. Gaul. It comprised about 7 or 8 per cent. of the total crop, and Mr. Gaul observed that it was a "great grower". It is unusual for Italian rye grass to persist in a pasture for more than two or three years except under special conditions. It may become a permanent constituent of irrigated pastures, in which case it provides valuable winter feed. It is known to occur also in permanent pastures under moist conditions in New Zealand—much the same conditions apparently as prevail in the field in question on Mr. Gaul's farm.

The practice of including from 5 to 8 lb. of Italian rye grass seed when sowing down a field to permanent pasture may be recommended for districts of good rainfall and a long growing season.

Detailed awards are shown in Table 2.

TABLE II.—AWARDS: WARRAGUL MEADOW COMPETITION.

Name.	Yield.	Nutritive Value or Quality.	Palatability.	Uniform and General Appearance.	Freedom from Weeds.	Total.
Possible points ..	**50**	**20**	**10**	**10**	**10**	**100**
Jones, G. R. ..	40	19	9	9	9	86
Young, J. F. ..	38	19	9	9	9	84
Manley, G. ..	38	19	9	8	9	83
Bingham, W. J., Exhibit B. ..	35	19	9	8	9	80
Gaul, W.	35	19	9	8	9	80
Stoll, H. F. ..	35	18	8	8	9	78
Gaul, S.	35	18	8	8	8	77
Young, J. F. and Sons	35	17	8	8	9	77
McLaughlin, J. ..	27	19	9	8	10	73
Bingham, W. J., Exhibit A. ..	30	18	8	8	8	72
Keating, J. F. and Sons	27	18	8	7	9	69
Heywood, G. ..	27	18	9	7	7	68

The Tobacco Crop

Topping, Suckering, Harvesting

By G. E. Coghlan, Tobacco Expert

THE lean crop that most tobacco growers will harvest this season may be regarded by many as a legitimate excuse for harvesting leaf that in normal circumstances would be left in the paddocks.

Conditions governing the disposal of the tobacco crop have altered very materially during the last three seasons and it is hoped that if the attention of growers be directed to a consideration of these changes, they will realize that there is no justification for harvesting trashy or poor quality leaf.

During the season 1931-32, a rapid expansion of the tobacco industry occurred in every tobacco growing State in the Commonwealth. In that year the Australian production of leaf was greater than the total quantity produced in the preceding five years, being estimated at approximately, 15,000,000 lb. of cured leaf. In 1932-33, a further 5,000,000 lb. of cured leaf was produced, despite adverse seasonal conditions and a disastrous series of frosts. Thus in the past two seasons, Australia's total production of tobacco leaf approximates 20,000,000 lb., of which about 15,000,000 lb. has been marketed.

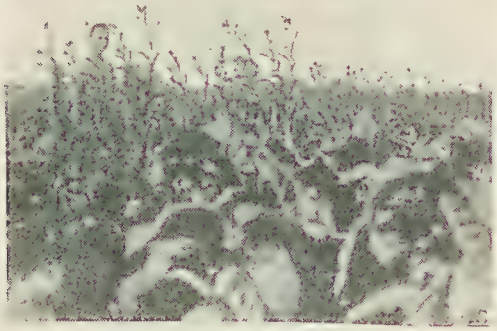
The surplus of 5,000,000 lb. is embarrassing, both to the grower and the buyer, and is the result of two inter-related factors. Firstly with the exploiting of new areas by inexperienced growers, it was inevitable that a fair proportion of immature and inferior quality leaf should be produced. Secondly, no local market for large quantities of darker grade leaf had been developed. As a result, manufacturing interests were prepared to purchase only sufficient quantities of leaf of qualities classed as M2 and lower to replace their annual usages of these grades.

It is obvious then, that the buyers regard this class of leaf as a bad risk, since they are not prepared to carry large excess stocks. As a consequence, the grower must also regard it as a bad risk. Up to the present, buyers have shown no hesitation in purchasing the brighter grades of tobacco.

A reference to consumption figures over the past two years, shows that about half the total leaf purchased has been manufactured, consequently it would appear that relatively large supplies of all leaf and especially of the lower grades are still in the hands of the buyer. For this reason, there may be little competition among manufacturers for this season's output of poorer quality leaf. As it is anticipated that there will be no large-scale purchases of grades lower than M1, any laxity in harvesting should be guarded against and it would be wise for growers to refrain from harvesting leaf, which their experience warns them will not come up to the required standard.

Topping, suckering, and harvesting are operations controlled by the grower, which greatly influence the quality of the cured leaf. Those growers who have not already completed topping, should consider the potentialities of each individual plant, as they perform this operation. In most tobacco fields this season, there is a huge variation in the vigour and

growth oft-times of adjacent plants. While a normally healthy plant may successfully mature 16 to 18 leaves, a weak or sickly plant may successfully mature only half that number. Thus it would be useless to make any arbitrary statement as to the number of leaves that should be left on each plant, but growers are urged to consider carefully the general health of the plant when determining at what height it should be topped.



An untopped crop.

The maximum number of leaves can be left on strong healthy plants, which owing to the ravages of Blue Mould among their neighbors, occupy a more or less isolated position. On less sturdy plants, however, "high topping" or the leaving of an excessive number of leaves, will result in the production of trash at the expense of otherwise good leaves. On the other hand excessively "low topping" will result in the production of a coarse and generally dark type of tobacco, lacking in quality.

Topping experiments carried out by the Department of Agriculture, show that topping has an important influence on yield and quality. From plots topped in a normal common-sense fashion, the greatest weight of good quality cured leaf was obtained. This series of plots yielded 99 lb. of cured leaf per acre more than did untopped plots, and of this 99 lb., 79 lb. was of the grade classed as Bright Mahogany. "High topped" plots yielded midway between "normally topped" and "untopped plots", so it will be realized that this apparently simple operation has a considerable influence on crop yield.

Topping is of little value, unless attended by subsequent suckerings. The main function of a plant is to provide for its reproduction by the development of a seed head. A considerable amount of nutriment and energy is directed toward this end. When at topping time, the embryo seed head is removed in an effort to compel the plant to divert its energies toward leaf production, the plant immediately throws out a new growth from the points at which the leaves join the central stalk. This new growth is known as a sucker and if allowed to persist, eventually will carry a seed head. If good quality leaf is desired, this sucker growth in most cases must be rigorously controlled.

Experimental evidence obtained at Shepparton shows that by allowing topped plants to sucker at will, the yield of cured leaf was reduced by 180 lb. per acre. Observation of the yield of plants which have been left to seed shows that the yield of leaf is decreased, the rapidity of maturity is delayed, and usually the leaf, although it may possess a good colour, lacks other qualities essential to high class tobacco.

In a season such as the present, when almost every tobacco crop in the State has been ravaged by Blue mould, it may be anticipated that considerable difficulty will be experienced in the curing of the leaf. The disease has taken heavy toll of the plants, even those which have been strong enough to withstand repeated attacks in many cases being stunted and malformed.

(*Continued on page* 145).

Topped and suckered.

Establishing New Pastures

Mixtures Recommended

By J. E. Harrison, B.Agr.Sc., Senior Agrostologist.

IF new pastures are to be permanent and to make luxuriant growth, care and skill are required in their establishment.

Early sowing is always desirable, especially for the development of clovers. Land already in fallow, if rolled and harrowed as soon as fair rains fall, and given a few harrowings to kill weeds as they strike, will soon work down into a fine firm seed-bed that should be in very good order to receive grass and clover seeds.

Unploughed land should be broken up at the first opportunity. Careful ploughing to turn under the surface soil and bury weed seeds will eliminate many competitors of the pasture plants. If the soil turns over as a rough and uneven field, unlikely to mellow rapidly into a fine seed-bed, it may be desirable to crop with oats this autumn and defer the establishment of a pasture until next year. Where oats are sown, 1 to 2 lb. of subterranean clover seed may be broadcast over the land immediately. This clover makes good runner growth in an oat crop, and sets seed before the latter is harvested. The soil is thus stocked with subterranean clover seed in preparation for pasture establishment the following year.

If the land was under crop last year, or if it turns over very well, it should be possible to secure a satisfactory seed-bed within reasonable time to sow this autumn. Many farmers, especially in central Victoria, will prefer to drill in rye grass and subterranean clover without further cultivation on land cropped with oats last year. The practice is fairly common there, and satisfactory stands generally are obtained. It is not usual in other districts, however, where growers prefer to plough the land, and with springtooth, roller, and harrows, work it down into a fine tilth ready to receive the pasture seeds.

Skill and judgment are required in timing the last few strokes with the harrows before sowing the seed. These last workings not only fine down and consolidate the surface soil, but they also carry out the important work of killing weed seedlings. The land should be observed closely from day to day, especially after rain or heavy dew, to see whether weeds are showing through. As soon as they appear, the first chance should be taken to work the land on a dry day, when the weed seedlings will quickly perish if rooted out by the harrows or springtooth cultivator.

In deciding upon a mixture, few farmers will go beyond those species which local experience has proved to be satisfactory. Under practically all conditions, perennial rye grass will

be included, and farmers have a choice here between two approved strains, either Hawkes Bay, as sold in sacks sealed by the New Zealand Department of Agriculture, or the Victorian, sometimes called the Western District strain, obtainable in sealed sacks from the

A permanent pasture showing predominance of perennial rye grass.

Perennial Rye Grass Growers Associations at Colac, Kyneton, and Clunes. These associations certify that their seed is harvested from fields of rye grass approved of by the Department of Agriculture, and are endeavouring to place seed of high purity and germination on the market.

In areas of good rainfall—35 inches or more—the use of cocksfoot to supply green summer feed is specially recommended. It definitely requires favorable conditions, however, such as prevail on good loamy soils in districts receiving ample rain. The varieties of cocksfoot include Danish, New Zealand (Plains), New Zealand Akaroa, and Victorian cocksfoot. Akaroa cocksfoot, certified by the New Zealand Department of Agriculture, is the most uniform pasture type at present sold on our market, though, if purchasers are able to obtain their supplies from old cocksfoot stands in Gippsland, they may be reasonably sure of obtaining seed of a good type.

When cocksfoot is included in a mixture, the proportion in relation to rye grass depends on the nature of the soil. If the soil is loamy and friable, the cocksfoot should dominate; about 15 lb. cocksfoot and 7 or 8 lb. perennial rye grass, together with 3 to 4 lb. of subterranean clover, constitute a good mixture. When the soil is heavy, and specially favours rye grass, the proportions are reversed, and from 12 to 15 lb. of rye should be sown with 7 or 8 lb. of cocksfoot. White clover is also usefully introduced on to such soils, and from 1 to 2 lb. each of white clover seed and subterranean clover seed are included in the mixture. On moist fertile flat land, especially if the soil is heavy, it is usual to omit both cocksfoot and subterranean clover and sow down 20 lb. perennial rye grass with 2 or 3 lb. of white clover.

Subterranean clover may be sown in all areas not sufficiently moist for the growth of white clover. The great bulk of commercial subterranean clover seed belongs to one strain, very suitable for average conditions, and is recommended for general purposes.

White clover seed comes mainly from Europe and from uncertified sources in New Zealand. The seed certified by the New Zealand Department of Agriculture is expensive, and perhaps a

A permanent pasture with white clover predominant.

mixture consisting of one part of certified seed and three parts of uncertified seed would be the most economical to sow.

If good first-year grazing is required from a young pasture, Italian rye grass or Wimmera

rye grass may be included with advantage. In districts with, say, 27 inches or more rain, Italian rye grass is probably preferable, while Wimmera rye grass may be expected to give better results in other districts.

The question may perhaps be asked, how one can make sure of getting good seeds. The answer is to buy certified seeds or to ask for guarantees as to origin or strain; to discover the purity and germinating capacity of the seed offered for sale; and to deal with reputable firms only. This Department is able to help growers determine the purity and germinating capacity of seeds offered for sale. The Seed Testing Station, Agrostology Branch, Burnley Gardens, E.1, has been established for the purpose, and if samples are forwarded, tests will be conducted, and the results communicated as quickly as possible.

A good permanent pasture mixture with perennial rye grass, cocksfoot, and white clover predominating.

Perennial rye grass seed and subterranean clover seed are sown in various quantities, the general principle being that in districts of good rainfall the heavier quantities usually are sown. In districts with about 23 or 24 inches of rainfall, a mixture giving good results is from 10 to 15 lb. of perennial rye grass and 2 to 3 lb. of subterranean clover. Wimmera rye grass may be included at the rate of 4 to 5 lb. per acre for first-year feed.

An even distribution of seed of all species is very necessary. Perhaps a drill gives the best results, but broadcasting, either by hand or by means of a hand broadcasting machine, will give a uniform spread if the work is carefully and intelligently done. It is best to sow half the seed over the field in one direction, and then sow the remaining half at right angles.

Some seeds, such as rye grass, may be lightly drilled into the soil, but a better germination is obtained if the seeds are sown on the surface and the land is then very lightly harrowed and rolled.

It is desirable to apply about 70 or 80 lb. of superphosphate per acre at the time of sowing. If the seed is mixed with the manure, there should be no delay in sowing, as the seed will soon be harmed by contact with the acid in the manure. The superphosphate is preferably applied at the time of sowing, rather than earlier or later; and the more intimately it is in contact with the seed in the soil, the better the result which may be expected.

Potato Growing in Victoria

No. 8.—Inter-cultivation

By J. T. Ramsay, Potato Expert.

Previous articles of this series, which appeared in the March, April, May, July, and December, 1933, and January, and February, 1934, issues of the Journal, dealt with the condition and selection of seed, seed storage methods, change of seed, plant food requirements, the use of artificial fertilizers, preparations for planting, and planting.

THERE are important reasons why the soil should be cultivated after planting and during the growing period of the crop. First of these is the fact that well cultivated soil is capable of absorbing and retaining moisture to a much greater degree than soil which is compact or hard.

The second important effect of inter-cultivation is that the physical condition of the soil is maintained at a good standard, thus permitting a sufficiency of aeration to take place. This has the effect of promoting the action of beneficial bacteria, which break down insoluble plant foods in the soil and make these available as food to the plants.

Further, by improving the mechanical condition, inter-cultivation permits freer root ramification and extension in search of the elements of fertility. Good mechanical condition, too, has a very large influence on the shape of the tubers. In hard or compact soil the tuber, when increasing in size, meets with restriction which causes deformity of the natural shape of the particular variety grown. In well-cultivated soil, however, the tuber is free to expand without restriction, and so develops to full size with more perfect shape. The last principal effect of inter-tillage—and not the least—is that foreign plants or weeds are kept in subjection or entirely killed—thus permitting the crop to benefit to the full extent from the plant food and moisture content of the soil.

Methods of Cultivation.

Harrowing is the cheapest form of cultivation utilized in agricultural practice. By its employment a large area of ground can be cultivated to a shallow depth in the course of a day at very small cost per acre. Because of the cheapness of this method of cultivation, potato-growers should utilize it whenever practicable in order to keep down production costs.

After planting, and until the crop is well up in the rows—even to a height of 4 or 5 inches—effective work in preserving good surface tilth can be done by harrowing at frequent intervals of, say, one week. In the event of rain falling during this early stage of the crop's growth, the harrows should be used as soon after the fall as the ground is in working condition. This will prevent caking, or baking, of the top, and help to conserve the moisture.

Frequent harrowing at this stage is an excellent and economical means of killing off weeds as they germinate, and, if done systematically, will eliminate the necessity for much weeding later on. Once the plants reach the height of 4 or 5 inches, subsequent cultivation, up to a time when they are about in full bloom, must be confined to the horse hoe, an implement designed specially for cultivation between the rows of any growing crop. It is capable of being adjusted in the width and depth of cut to suit the requirements of any stage of growth of the crop.

This implement is now procurable for operating in one, two, or three rows at a time. The double and treble row cultivators being most suitable for large areas. The three-row horse-hoe can be worked in the majority of soils by two horses controlled by one man—whereas, with the single row horse-hoe, three men and three horses would be required to cover the same ground in an equal amount of time. Owing to the wide variations of soil textures and seasonal conditions, it is not

possible to set down any hard and fast rule as to the number of horse-hoeings that should be given to the crop, but it may be safely advised that there should not be less than two to three during the season. The intervals of time between the hoeings will vary with the seasons and the rate of growth of the crop, but the interval between each horse-hoe cultivation should be about a fortnight.

One point that can be strongly advocated is that opportunity should be taken to use the horse-hoe as soon after rain as possible, the objectives of course being the reconditioning of the tilth and the conservation of water.

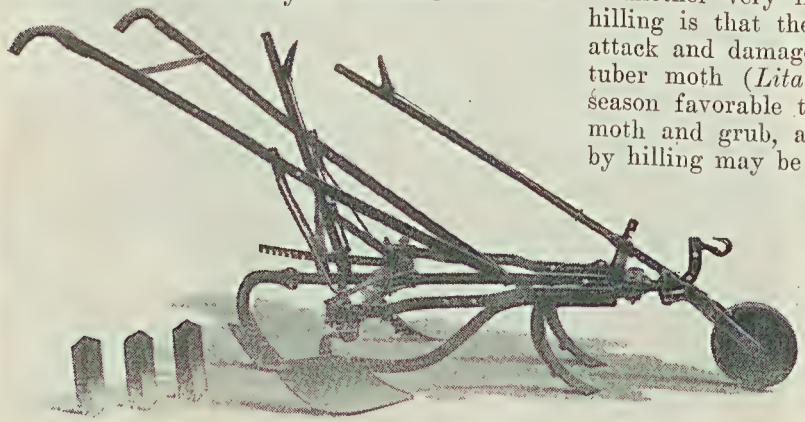
The first hoeing of the season should be done at the greatest depth at which the team can manage the implement and at as wide a distance as possible without unduly disturbing or damaging the plants on either side. Each subsequent hoeing should be at a narrower width and a shallower depth in order to accomodate the cultivation to the increased growth of the plants. If the season permits an approximation to these suggested times of hoeing, the plants normally should be just coming into full bloom by the time the third cultivation is given.

Weak and Foreign Plants.

At this stage opportunity should be taken to go through the crop in order to remove any obviously weak plants and destroy them, as not only are they non-productive and unfit for use as seed or for consumption, but they are also potential carriers of disease to a succeeding crop.

Rogueing, or the removal of plants not true to the variety supposed to be grown, should also be done. It is only at this stage that an accurate judgment can be made as to whether the whole of the plants growing are of any particular variety. When in full bloom the foreigners to the variety desired can be observed at a glance by the colour of the flower, or by the character of the haulm or by the peculiarity of the leaf shape or its structure. Later it is most difficult, and in some cases almost impossible to distinguish certain varieties from each other.

The growth of pure parcels of any particular variety is most desirable. Where varieties are mixed, yields are often lessened owing to the differences in the period of maturation. Rogueing at this stage is a profitable operation, particularly when it is intended to market the produce as seed. Seed parcels of mixed varieties have a comparatively low cash value. Parcels of seed which are pure command a figure always above current market prices. The sale of seed is the most profitable of the potato trade, and rogueing when the plants are in bloom to eliminate strangers is one way to get a share of this extra profit.



A popular type of horse-hoe with hilling attachment.

Hilling.

The next operation in inter-cultivation is the hilling or moulding up of the plants in the rows. This is advisable for two reasons, the first being that is saves the tubers formed near to the surface from being scalded by the sun or greened by the action of light. Tubers greened by exposure are unfit for consumption, being bitter to the taste and mildly poisonous, owing to the development of solanum. Cases are on record where stock have died from being fed on greened tubers.

Another very important result effected by hilling is that the tubers are protected from attack and damage by the grub of the potato tuber moth (*Lita solanella*). In a hot dry season favorable to the rapid increase of the moth and grub, a crop which is unprotected by hilling may be riddled in less than a week by these grubs. Good hilling, combined with good tilling, is a safeguard against loss from this source, up to the point of digging.

A further benefit from hilling up the crop is that digging, either by machine or hand, is facilitated as

Hilling-up at the rate of eight acres per day.

the machine or fork can be projected with greater ease to a depth slightly below the level of the deepest tubers, and there is less damage to the tubers.

Inter-cultivation under Irrigation.

Inter-cultivation is perhaps the most important of all operations connected with the growth of potatoes under irrigation. After the planting and harrowing operations described previously have been completed, the land should be harrowed frequently, to maintain a nice tilth. Local conditions will determine the frequency of this operation, but on no account must setting of the surface soil be allowed to take place.

Harrowing may be continued until the plants are 4 or 5 inches high, after which recourse must be made to inter-cultivation in the rows by the use of a one, two, or, three row horse-hoe. The usual practice is to use a one row horse-hoe, which is sufficient for small areas, as it is capable of getting over from 3 to 4 acres per day. In the early stages of growth, when the plants are small, this implement should be set to cultivate deep and wide, i.e., close up to the plants in the rows. Each subsequent inter-tillage should be given with a progressively decreasing depth and width, so that the growing plants may not be injured at the roots. The horse-hoe should be used frequently between irrigations, and as soon after irrigations as the ground will permit working.

Irrigating.

In practice from 5 to 8 chains is the most effective length to run the irrigation water. The lighter the soil, the shorter the lands should be. Presuming the season to be quite dry, under average conditions it will be found necessary to irrigate about 3 to 4 weeks from the date of planting. At that time the plants from sprouted seed should be showing well up in the rows and their foliage commencing to spread. Prior to irrigating, the horse-hoe, with the hilling attachment or broad tine adjusted, should be run through the rows, and the soil on either side thrown up on the rows, but not sufficiently high to cover the plants. This facilitates the application of water. Care

Potatoes growing under irrigation.

should be taken not to commence irrigating until there is a good "head" of water on hand, as without this the irrigator has but poor control over the regulation of the supply. The water should *never* be allowed to flow over the tops of the rows, but should be confined between the drills.

The flatter the land being irrigated, the greater the flow of water it can take within a given time. The greater the fall, the less the flow that can be taken in the same time. Being less permeable, clay loams should be irrigated at a slower rate than light sandy soils. Individual growers must study their own conditions closely since only in this way can one determine the methods most likely to give him the best results.

In a season without rain, subsequent irrigations will be required at intervals of about three weeks. The final irrigation should be given not later than when the plants are just going off the bloom. Cultivation and hilling up should then be completed and the crop allowed to mature without further cultivation. It is of importance that cultivation after each irrigation be given as soon as the ground is fit to work, and that the area be then hoed as quickly as possible.

Excessive application of water will produce tubers of very low table quality, induce rotting in the field, and prevent adequate cultivation.

Irregular or insufficient application of water will cause a poor yield, and large percentage of second growth. The potato crop requires continuity of moisture without excessive wetness. Given that, the irrigation districts, because of their arid atmospheres and high potash soil content, can produce potatoes of the very finest table quality.

Fungicides Act

Prosecution for Offence

IN the Fitzroy Court on the 8th February, 1934, the firm of D. & W. Chandler, Hardware Merchants and Manufacturers, was proceeded against for a breach of Section 9 (1) (*c*) of the Fungicides Act. The case was heard before Mr. Brown, P.M., and a bench of honorary magistrates. Mr. W. P. Nunan, of the Crown Law Department, appeared for the Department of Agriculture, and Mr. W. Ritchie for the defence.

The evidence of Mr. W. C. Robertson, Chemist, of the Department, disclosed that "Red Rose" Nicotine Sulphate, sold by the defendant firm was incorrectly labelled in that the percentage of nicotine—the active ingredient—was not stated on the labels attached to the receptacles containing the insecticide. The analysis of the "Red Rose" Nicotine Sulphate showed 35.88 per centum of nicotine against the usual guarantee of 40 per centum for this commodity—a deficiency of 4.12 per centum, equivalent to four shillings and sixpence per gallon.

Mr. Ritchie, counsel for the defendant firm, explained that his clients had communicated with the manufacturers in England with reference to the strength of the article and had in every way endeavoured to carry out the Act.

The Bench held that the label was incorrect and misleading but considered that a light penalty would meet the case. Defendants were fined £1 with £2 6s. 6d. costs.

Replacements Necessary in the Dairy Herd

By A. C. T. Hewitt, M.Ag.Sc., Dairy Herd Manager, State Research Farm, Werribee.

THE total number of cattle necessary on a self-contained dairy farm in order that there may be a certain number of cows in milk all the year round, and the number of heifers that should be reared annually to replace losses, are questions that only the more progressive dairy-farmers can answer. It is seldom realized that the total number of cattle to be kept on the ordinary dairy farm is approximately double the number of cows in milk at any time, the "total number" of cattle including cows in milk, dry cows, springers, heifers, heifer calves, herd sires, &c.

On dairy farms where the heavier breeds of dairy cattle are maintained there will be an even larger ratio of cattle on the farm to those actually in milk, because most of the bull calves will be reared and fattened for selling as vealers and steers, and most of the culled cows will be held and fattened before sale for beef. On the other hand, on farms where it is the practice not to rear any heifers, but to maintain the dairy herd at a certain strength by the purchase of springers and newly-calved cows, there will be a minimum of cattle other than those in milk. This method of maintaining the strength of the herd is one that is dying out except on farms close to the metropolitan area, where relatively high land values and feed costs make the rearing of heifers unprofitable. On other farms it has been shown that by herd-testing and the use of high-production-bred bulls the dairy-farmer is able to breed heifers that usually give higher returns of milk and butter-fat than do those purchased from outside.

Red Poll Calves at Werribee.

In stud dairy herds, the proportion of cows in milk usually is smaller than on ordinary dairy farms, because bull calves are reared for later sale, and many well-bred cows are retained for breeding purposes beyond their economical dairy life. Again, there is a tendency not to cull the heifers until stud prices can be obtained for them.

Each year replacements have to be made in the dairy herd, as a certain percentage of losses is inevitable. Cave, an American investigator, states that the period of profitable production of the average dairy cow is approximately five years—on this basis, 20 per cent. of the mature cows in the herd will pass out annually. Danish investigators, however, state that, in order to maintain a herd above a certain standard of production, as many as 29 per cent. of the cows in any dairy herd require replacing annually. In this article, which deals with Red Poll and Friesian herds at the Werribee Research Farm, it is shown that 16 per cent. of the cows pass out annually, but this figure does not include an adequate allowance for culling for production. If all Friesian cows producing less than 370 lb. butter-fat, and all Red Poll cows yielding less than 330 lb. butter-fat in 273 days (mature

equivalent production) were culled from the herds, the necessary replacements then would be 28¼ per cent., a percentage approximately equal to the Danish figure quoted above. Actual figures for cows culled for production are not shown, because the position with regard to culls was complicated by the large reduction sale held in September, 1930, when approximately one-third of the herds was disposed of. The percentage of replacements for increasing production, of course, will be variable, depending on both the average production of the cows in the herd and the standard of production aimed at by the farmer.

Nictitana, at 16 years old, rearing her own bull calf (left), and two foster calves.

The records of the stud Red Poll and Friesian herds maintained by the Department of Agriculture at the State Research Farm, Werribee, have been studied, and the results made available in this article to demonstrate many points of importance and interest, such as those quoted above. The records used are those for the five-years' period from 1928-29 to 1932-33 inclusive, during which time the herds have been in charge of the writer.

The departmental herds are maintained essentially as stud dairy cattle, but the results obtained in this article could be applied to most well-cared-for dairy herds. In these studs most of the heifer calves that are reared are retained for replacement purposes, and for improving production in the herds. In the figures and tables quoted below, bulls and bull calves have been excluded, except where otherwise mentioned. The average total number of cows in the herds has been expressed as 100, and all other figures have been adjusted pro rata, i.e., they are expressed as percentages. During the last five years, the average age of calving down the heifers has been 2 years 4 months old. In this article, females over 2 years 4 months old are referred to as cows, females between 6 months and 2 years 4 months old are referred to as heifers, and females under 6 months old are referred to as heifer calves. The heifer calves are mostly bucket fed.

The Proportion of Cows in Milk.

Theoretically a cow should calve once each year. After calving she should milk for nine months, be dried off (the drying-off process to take one month), and then have two months dry spell, during which time she builds up her bodily strength in readiness for her next lactation. Under such conditions, and regarding cows that are being dried off as cows in milk, just over 83 per cent. of the cows in the herd would be milking. In practice, theoretical results cannot always be obtained, and in Table I. it is shown that, on the average, in the "Victoria" studs 75 per cent. of all the cows maintained are milking at any one time. This figure can be regarded as very satisfactory, because many cows require more than two months' dry spell, especially cows finishing their lactations in poor condition, and aged cows.

TABLE I.—PERCENTAGE PROPORTIONS OF MILKING COWS TO DRY COWS IN THE HERD. (ANNUAL AVERAGE DURING THE LAST FIVE YEARS.)

Breed.	Cows in Milk.	Dry Cows.
	%	%
Red Poll	74·6	25·4
Friesian	75·4	24·6
Average	75·0	25·0

Seldom do 100 per cent. of the cows in a herd calve each year, as more frequently cows calve every 13 or 14 months rather than every 12 months. At the State Research Farm, nearly 93 per cent. of the cows have calved each year during the past five years, as shown in Table II. The percentage of calves for the two breeds agrees very closely, as do the figures in Table I., but, as regards the sex of the calves, the Friesian cows have borne considerably more heifer calves, while the Red Poll cows have borne more bull calves.

Sumatra. Culled at 10 years old and sold at Newmarket for beef in September, 1918, this Red Poll cow realized £32.

TABLE II.—THE PERCENTAGE OF CALVES DROPPED ANNUALLY.

Breed.	Total Percentage of Calves.	Percentage of Heifers.	Percentage of Bulls.
	%	%	%
Red Poll ..	92·8	45·0	47·8
Friesian ..	92·4	51·5	40·9
Average ..	92·6	51·2	44·4

Replacements Necessary.

In order that a dairy herd be kept at a certain numerical strength, annual replacement of cows that die or that are culled is necessary. The chief reasons for culling cows are old age, sterility, accidents, low production, and general appearance. In the Department's herds during the last five years 4.1 per cent. of the cows have died annually, and 11.8 per cent. culled for old age, low production, sterility (chiefly freemartins), and other causes.

As shown in Table II., there has been an average annual drop of 92.6 per cent. of calves, of which 51.2 per cent. have been heifers. Approximately, 75 per cent. of all heifer calves dropped have been reared to maturity and retained in the studs.

TABLE III.—THE AVERAGE ANNUAL PERCENTAGE LOSSES FROM THE HERDS SINCE 1928-29.

Breed.	Percentage of Deaths.	Percentage Culled.	Total.
	%	%	%
Red Poll ..	3·6	13·0	16·6
Freisian ..	4·7	10·5	15·2
Average ..	4·1	11·8	15·9

Summary.

A summary of the results of the above survey of the breeding experiences in the stud herds at the State Research Farm, Werribee, shows that, on the average, 75 per cent. of the cows of milking age are in milk at any time. Approximately, 16 per cent. of the cows will have to be replaced each year, due to losses brought about by culling and death. There has been an average drop of 93 per cent. of calves annually, and over half of these have been heifers. Therefore, for every 100 cows in the herds there have been 48 heifer calves dropped annually, and 36, or 75 per cent., of these have been reared and retained for replacement purposes. Sixteen of these 36 heifers have been absolutely necessary for replacing the sixteen cows that die or are culled from the 100-cow herd. Thus there have been available twenty heifers which it has been possible to use for replacing low-producing cows and further improving the herds.

Virginia, a Red Poll cow, culled at 20 years old and sold for beef.

Common Colics of the Horse

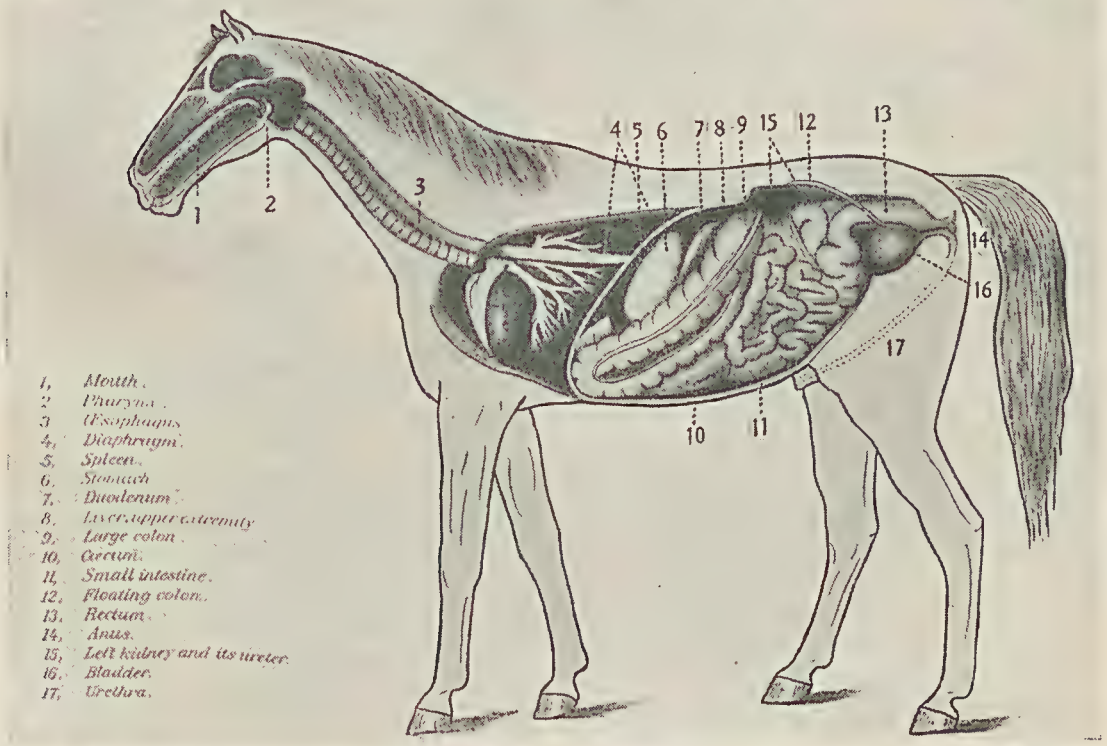
By R. N. Wardle, B.V.Sc., Veterinary Officer

COLIC is the name given to a variety of disorders in which the most noticeable symptom is a manifestation of abdominal pain, due to some form of irritation of the stomach or of a particular part of the intestines. There are many varieties of colic, the different names given to each generally having a bearing on the seat of the trouble as well as on its nature. For example, impaction of the colon or large intestine, which explains itself, is one of the most common forms of colic; gastric tympany, or excessive gas in the stomach, is another form.

A few facts about the digestive organs of the horse may be instructive as well as interesting. Relatively, the stomach is of small content, while the large intestine has a great capacity. The caecum or "water gut" also is comparatively large. There is no gall bladder in the liver for the storage of bile fluid. The combined length of the small and large intestines is almost 100 feet.

Because of the anatomical position and structure of the stomach, the horse, except in rare cases, is unable to vomit food or to eructate (bring up gas). For this reason any gases or foodstuffs present in the stomach must pass through the 100 feet length of intestine before they can be ejected. Where vomiting does occur it is almost always accompanied by rupture of the stomach and subsequent death.

The large intestine, in which the greatest number of cases of impaction both of ingesta (foodstuffs) and of sand occurs, is so arranged



The Digestive System of the Horse.

in the abdomen that there are three flexures or bends, and the lumen varies considerably. It is at two points particularly where the lumen of the intestine becomes smaller that impaction frequently occurs.

Treatment by Veterinary Surgeon Desirable.

Although there are cases of colic from which horses recover, either with the administration of one dose of medicine—usually a drench—or even without any aid whatsoever, it is desired to impress on horse-owners that at the onset of a case of colic, the severity of the pain shown is not always an indication whether the case will be a mild one, in which recovery will take place rapidly; or whether the illness will be prolonged and consequently serious.

Practically all forms of colic are relieved only when the offending material setting up the condition is passed along the bowel and finally evacuated. It should be realized, therefore, that the most desirable medicines for the treatment of colics are those whose action is quickest. These drugs, of which there are several, are used in very small doses, and are given as hypodermic injections by practising veterinary surgeons who also have many other aids for the treatment of colic cases that are not otherwise available to the horse-owner.

For this reason it is advised that, where available, a practising veterinarian be called in at once. If this were done most of the cases that end fatally would be saved. Even in less severe cases recovery would be more rapid than it usually is without the veterinarian's aid.

This practice of calling in a qualified veterinary surgeon early is adopted by the large carrying firms of the big cities, and they find the action profitable, in that rapid recovery means maximum efficiency for their teams. The same practice would be profitable also with the farmer, although the expense—owing to distance—may be greater.

Causes of Common Colic.

The cause of most colics is some abnormality in connexion with the food content of the digestive organs—the stomach and intestines. There may be overfeeding, flatulence due to gas formation during fermentation, or a stoppage in the intestinal canal, due to accumulations of either ingesta or sand. Bacteria, which are present in the digestive tract, also play a certain part in cases of colic.

The general exciting causes of colic have been described as "errors in the proper distribution of work, rest, watering, and feeding."

Let us take these factors in order—

(*a*) Work.

A horse should not be put into heavy work immediately after eating a large feed. If yoked up at once after feeding, he should be allowed at least half an hour before being asked to exert himself greatly. After a long exhausting period of work, he should be watered whilst hot—not when half cooled down. He should then be allowed a little time before being permitted to eat, so that his circulation and breathing may become normal. If possible, he should be given a small easily digested feed during the morning and afternoon rest periods in addition to his usual meals.

(*b*) Rest.

Periods of rest such as week-ends and holidays are times when rationing of fodder should take place. These are not the times to fill the horse up in order, as is often said, to fit him for his working days. During these days of rest, often in a stable and with no exercise, light feeds should be the order; at regular times a little laxative diet, such as green stuff and bran mashes, can be given with advantage. The giving of two or three packets of Epsom salts in a small bran mash every week-end is an excellent procedure.

(*c*) Watering.

It is generally considered that watering should take place before feeding, and this procedure undoubtedly is correct, especially after work.

After a period of work the body is greatly depleted of fluid which must be replaced before the tone of the system can be restored; this is best done by watering the horse while he is still hot, rather than waiting until he has partially cooled down; he will then be better fitted to do justice to his feed. Watering after feeding, when the feed is taken while the horse is more or less exhausted, as is the case after work, is one of the most common causes of attacks of colic. First thing in the morning, however, especially during cold weather,

a horse will not drink before eating, and provided a period of, say, half an hour elapses between the finish of feeding and watering no harm will be done.

In some stables water is provided in the stalls, and the horse drinks just when he desires; this system is quite good.

(*d*) Feeding.

In his natural state the horse roams over large tracts of country, eating as he roams. He is a continuous feeder, with the result that once the stomach has become filled to a certain degree, partly digested food is passing out of the stomach into the small intestine more or less continuously. We should consider this fact when horses are being artificially fed, and the advice, "Feed small feeds frequently" is tendered.

Thus the giving of four smaller feeds is better than three large ones. The food should be of the best quality. Of all domesticated herbivorous animals horses can withstand least any defective foodstuffs. Good oaten chaff may form a maintenance ration, but for working horses an addition of oats and/or bran is necessary.

Horses should be separated for feeding. When several have to feed together, it is found that some will be prevented by fear from getting their share, and the amount they do get is often bolted; the greedy feeder also bolts his food in order that he may eat more than the others in the same time. In these cases there will be insufficient mastication, and indigestion, and perhaps colic, will result.

Teeth defects also are a cause of indigestion. Horses should be watched when they are feeding, and evidence of faulty mastication, such as the slobbering of saliva and the dropping out of food noted. In such cases the mouth should be examined and any defects of the teeth remedied by an expert.

After long and severe work it is very unwise to place a large feed before a horse. The digestive organs are not then in a state to cope with a big quantity of food. Water should be allowed, first of all, but until the animal has recovered from fatigue food should be withheld.

Changes in diet should be brought about gradually. Colic may be caused by giving hard feed solely to horses brought in from grass. By commencing with a bran mash or two, then chaff and bran in equal proportions, damped for preference, and then gradually reduced amounts of bran, horses may be brought in to an ordinary ration in a week without risk of illness.

Sand is picked up by the grazing horse in two ways:—1. On sandy country the soil is loose, and often sparsely covered with herbage. In grazing, the grass is eaten close to the ground, and sand is thus picked up with almost every mouthful. Also after rain or wind quite appreciable amounts of sand are splashed up on to the leaves of grasses and weeds, and thus taken into the digestive tract when such herbage is eaten. 2. The habit stock have of licking and eating soil, apparently endeavouring to rectify a deficiency in mineral matter, is not an uncommon method by which sand may reach the intestines.

In the first instance, if a stock-owner turns his horses out on light sandy country when sparsely grassed he must realize the risk he takes in getting them "sanded." The second instance may be rectified by supplying mineral matter to the horses in the form of a salt and bone-meal lick.

Spasmodic Colic.

Spasmodic colic is so named because of the fact that the pain shown by the affected animal is not constant, but keeps on occurring at short intervals between which the horse is free from pain symptoms.

As a matter of fact, this peculiarity need not be confined to one class of colic as diagnosed by a veterinarian; hence the name "spasmodic" in reference to colic is more a popular than a scientific term.

Cause.

Most cases in which the pain is spasmodic, however, are concerned with the small intestine and stomach, and the cause is the imperfect mastication of dry food—generally chaff—which becomes impacted in the small intestine close to its opening into the caecum. In some cases the impacted material may be in the first portion of the small intestine, which is shaped like the letter S. In these latter cases the stomach becomes involved generally by reason of gas formation. This form of colic occurs where the horse is worked too soon after feeding, or, may be, during work in hot weather, and where dry chaff is bolted in an unmasticated form.

Symptoms.

The pain evinced is acute, and the animal shows this by throwing itself down and rolling violently, then getting up again, and perhaps

remaining quiet for a short interval, after which the performance is repeated. Respiration is hurried, and often the patient breaks out into a profuse sweat.

Often the patient will attempt to pass water by stretching out. This does not indicate a stoppage of the water, and inhumane, irritant measures should not be adopted to make the horse pass urine. Get the patient over the bowel trouble, and it will have no difficulty in voiding urine.

On listening at the abdomen one often hears a tinkling sound instead of the normal movement of the healthy organs. Rectal examination by the hand helps to prove that the large intestine is not the seat of trouble as the portion that can be felt is quite soft.

Faeces (manure) may be passed in fairly normal amounts during the attack. Relief is obtained when the dry material commences to pass into the large intestine. The more severe cases of this form of colic are those in which gas formation occurs in the stomach and that part of the small intestine in front of the impaction.

Occasionally fatal cases occur, and these may be the result of a twist occurring in the intestine.

TREATMENT.

No. 1 Drench.

A drench may be made from—

Raw linseed oil, 1 to 1½ pints.
Oil of turpentine, 2 oz.
Aromatic spirits of ammonia, 2 oz.
Tincture nux vomica, ½ to 1 oz.

The components should be mixed together and the drench given immediately the attack commences. The mixture suggested makes an excellent first-aid drench for most kinds of colic. If such a drench be administered properly much good will be done, and its action will not be detrimental to any further treatment given by the veterinarian should one be called in. One hour after the first drench the following mixture may be given and repeated again in two hours' time:—

No. 2 Drench.

Aromatic spirits of ammonia, 2 oz.
Sweet spirits of nitre, 1 oz.
Water, ½ pint.

In all these common colics the patient should be made as comfortable as possible, and placed in a protected yard or large loose box with a soft, well-bedded floor and allowed to roll. Water should be available at all times, and the patient should be rubbed regularly with wisps of straw.

On no account should opium preparations—laudanum or chlorodyne—be used in the treatment of colic cases. Their administration may allay pain temporarily, but as they tend to stop bowel movement they are distinctly harmful.

Impaction Colic.

The complaint known as impaction colic is the common form of food impaction, namely, impaction of the large colon. It is invariably due to overfeeding—often the result of injudicious feeding during week-ends and holidays.

SYMPTOMS.

Before showing actual pain the horse may appear dull and listless; when pain appears it is of a dull type. The patient may paw with his feet, walk around his box or yard and look around at the flanks. Later, after making several ineffectual attempts, he will lie down, and, apart from looking around at his flanks and giving one or two partial rolls, may remain in the recumbent position for a considerable time.

Examination by way of the rectum will prove the diagnosis directly, as the engorged and impacted large intestine can be felt. Any manure present in the rectum will be rather dry and formed, and generally that passed out is in quite small quantities—two or three dry masses rather than a normal motion. The sounds of bowel movement are generally absent; when there is any movement it is of slight degree, and the sound, as ascertained by listening at the flanks, is abnormal.

TREATMENT.

Copious enemas, repeated every hour, should be injected. The oily drench mentioned for spasmodic colic should be given at once, and the No. 2 drench, described in the previous case, should be given every two hours.

This form of colic is one in which rapid recovery must not be expected, and it is often necessary to repeat the dose of raw linseed oil and turpentine. Some cases extend over days, but during this time constant stimulant treatment must be given. Signs of recovery can be ascertained by listening at the abdomen for sounds of movement of the intestines, and ultimately large masses of faeces will be passed. A veterinary surgeon

should be called in; he will use powerful and quick-acting drugs and prescribe further treatment in the nature of bowel stimulants.

Sand Colic.

Sand Colic is a form of impaction in which the impacted mass, instead of being ingesta, consists of sand. The large intestine is the portion of bowel affected, and it is invariably at the most posterior flexure or bend that the impaction takes place.

Sand may be present in the intestines of a horse for some considerable period. In such a case it is spread as a coating over the intestinal floor, in which form it may cause a certain amount of unthriftiness. Should some condition arise whereby this sand is moved along without being expelled, it may mass up at the narrow bend of the large intestine, when it will cause a serious colic.

Symptoms.

The symptoms are similar to those described for Impaction Colic except that the pain shown generally is much greater, and there are early signs of inflammation, as shown by the injected eye membranes. Bowel movement is at a standstill, and rectal examination will help to confirm the impaction.

The blockage in the intestine is often so absolute that even gas cannot pass along, and in these cases the sand colic is complicated by flatulence. This is a bad sign, and may mean a fatal termination.

Treatment.

Should the impacted mass be of great extent (and the writer has seen enough sand to fill a stable bucket taken from a length of about 3 feet of the large intestine) the case will almost certainly end fatally.

When the trouble does not appear severe, commence with a dose of 1 pint liquid paraffin in which is shaken up 2 oz. turpentine, 1 oz. tincture nux vomica, and 2 oz. aromatic spirits of ammonia.

This should be followed in two hours by a drench of 1 pint of strong black coffee, including the grounds, this drench being repeated at intervals. The stimulant No. 2 drench previously mentioned may be given every two hours.

Copious enemas should be given every hour, and massage or kneading of the abdomen, especially if this be done when the horse is lying in a furrow on its back, may be advantageous.

The action of some of the quick-acting hypodermic injections, as used by the veterinary surgeon when given at the outset, would pass the sand on before the impaction became acute. Whatever correct line of treatment is undertaken, the earlier it is commenced the greater is the chance of recovery.

Flatulent Colic.

Flatulent Colic, another fairly common trouble, is characterized by the presence of gas in the intestine—generally the large one. Pain is evinced by the action of the horse going down and rolling. The breathing is hurried, and, generally, he has rather a panicky look.

In the first stage, little or no distention of the abdomen is apparent, but very soon the distention becomes quite evident, and is noticed more particularly in the offside flank. When distention is extreme, rolling is not freely indulged in, and if the animal lies down it does so with great care.

If besides tympany or flatulence of the intestines a similar formation of gas occurs in the stomach, the severity of the illness is greatly accentuated, and the symptoms, such as pain, breathing, &c., become more pronounced.

Unless the correct treatment be given in such a case, fatal results caused by rupture of the stomach are likely to accrue. Treatment of this condition is dealt with under the heading, "Wheat Colic."

A point for special notice in dealing with Flatulent Colic is that the symptom of flatulence invariably shows at a late stage of the progress of some colics, notably, Impaction Colic—both of ingesta and of sand—and colic due to a twist of the intestine.

In the latter case the horse will die; in the former, a speedy passage of the offending impacted mass will mean a reduction of the flatulence.

If there be inability to bring about a speedy passage of the impacted mass, it will be necessary to endeavour to control the flatulence until such time as a free passage is obtained.

Treatment.

The "stand-by" drench of 1-1½ pints raw linseed oil and 2 oz. of oil of turpentine can be given safely, but in case there is any tympany of the stomach it is not advisable to include aromatic spirits of ammonia or carbonate of ammonia. One teaspoonful of lysol might be added with advantage.

Copious enemas should be given frequently, while hot fomentations—given by the aid of blankets wrung out in hot water—undoubtedly help in the treatment.

Puncture of the intestine through the abdominal wall is a speedy method of reducing the tympany, but owing to the susceptibility of the horse to peritonitis this operation should be left to the discretion of the veterinarian.

Another line of treatment for flatulent colic, but one which necessitates the ability of the person treating the case to administer solid medicine in form of balls or capsules, is as follows:—Give a physic ball of correct dosage for size of horse, and at intervals of two hours administer ½-oz. doses of salicylic acid in capsules.

Wheat Engorgement.

Each year at harvest time there are cases of illness in horses due to the eating of wheat in more or less large quantities. As prevention is better than cure, one might issue the warning to farmers to see that fences are in good order and that gates are kept closed.

The two main sequels to wheat engorgement are Colic and Laminitis or Founder. In all cases of wheat engorgement the horses should be taken to water immediately and allowed to drink as much as they desire; in addition, they will benefit if while drinking they be allowed to stand in water up to their knees. The foregoing statement will be questioned by many people, but it is given with the greatest confidence and can be followed unfalteringly. After this watering, they may be left standing in the water as long as is convenient, though two or three times a day they should be exercised for at least fifteen minutes.

In cases where it is known that fairly large amounts of grain have been ingested, it is advised that immediate treatment be given by drenching with bicarbonate of soda up to ½ lb. in as much water as can be poured down. Enemas, as described later, are also beneficial.

Whenever possible the services of a qualified veterinary surgeon should be obtained as it is very important that proper treatment be carried out as soon as possible so as to prevent the disease becoming chronic with its consequent deformities, such as dropped sole, &c.

Where scouring takes place colic symptoms will seldom show, but founder may eventuate. A large proportion of cases where colic develops will terminate fatally unless the right treatment is given and commenced at the earliest moment.

The chief cause of the trouble is tympany, or flatulence of the stomach, and rupture of this organ is a common sequel.

If the services of a veterinary surgeon cannot be obtained, the following drench should be given at once:—

Strong liquid ammonia, 4 drams.
Powdered sulphate of iron, 1 oz.
Water, 2 pints.

When mixed these ingredients form a precipitate, and care must be exercised to see that this precipitate or solid material is given to the animal, and not left in the bottom of the container.

In addition one capsule containing ½ oz. salicylic acid should be given every hour.

The veterinarian in treating these cases would also use a hypodermic injection of certain drugs to expel the offending wheat as quickly as possible; failing this, an aloetic ball of suitable size or a drench of raw linseed oil and turpentine should be given.

Sand in Horses.

Sand colic is the most common colic in certain parts of Victoria, notably the Mallee, but if the advice given here be followed, large numbers of cases will be prevented.

It is a well-known fact that horses in districts with light or actually sandy soils pick up sand when out in the paddocks, and that this sand may remain in the intestine for a considerable time without causing a definite illness. In a great many cases the horse with sand becomes unthrifty, sluggish, dull, and listless; the coat is harsh and dry, there is a gradual falling away in condition, and death may eventuate when the horse becomes so weak that he is unable to rise after lying down to rest. In other cases of "sanded" horses no symptoms may be apparent, but even then it is necessary to treat the horses for the removal of the sand, as sooner or later some of them, under certain conditions of work and feeding, will become affected with sand colic caused by the accumulation of the sand in one impacted mass.

In a "sanded" horse the sand lies spread out over a considerable area on the lower surface of the intestine or in small accumulations gathered in pouches; and over this sand passes the ingesta (food), ultimately to be passed as manure.

During the passage of this excreta a certain amount of sand is picked up. Sometimes there is sufficient sand in one mass of droppings to be seen at once, but in most cases it is necessary to test the manure in the following manner:—The horse is tied up in a stable and bedded down with straw; a shovelful of his manure is picked up off the straw and placed in a bucket, which is then filled with water and stirred until all the manure is broken up. This is allowed to settle, and then the fluid is poured fairly slowly over the edge of the bucket. Several additions of water are needed, and the procedure repeated until all manure has been poured out.

Any sand remains in the bucket, and a dessert-spoonful from one motion is sufficient indication that an appreciable amount of sand is in the intestines.

Sometimes a "sanded" horse has a chronic diarrhoea, and in such cases the dried scour on hind legs and tail is characteristically dirty black.

After horses have been spelling on sandy country and brought into work again, it is strongly advised that they be tested for sand, and where definite evidence is found, treatment should be carried out. If this be done at once, cases of sand colic will be reduced and the efficiency of the horse teams increased.

Treatment.

Prepare the horse by feeding three small bran mashes—one each at morning, midday, and evening. Early on the following morning give a drench consisting of 1 lb. honey stirred into 1 to 1½ pints of warmed fresh milk. Feed lightly on damped bran and chaff, and then follow with the undermentioned mixture—

Bicarbonate of soda ..	6 oz.
Sublimated sulphur ..	6 oz.
Bitartrate of potash ..	3 oz.
Powdered nux vomica ..	1½ oz.

Mix and divide into twelve powders. Give one powder in damped feed morning and evening for six days.

On the second day, a drench of 1 pint of liquid paraffin may be given, and towards the end of the week's treatment another milk and honey drench is recommended.

Drenching.

Probably the safest method of drenching is by the use of a drenching bit, and any horse-owner will find this instrument a valuable one.

In no case should a drench be given through the nostril, and it is not necessary to elevate the horse's head too much. The tongue should not be held nor pulled out, but a little sideways movement of the tongue whilst still in the mouth may help swallowing in some cases.

If a drenching bit is not used it is inadvisable to try to elevate the head by pulling up with the halter; this only tightens and holds the lower jaw fast, and it is impossible for an animal to swallow freely under such conditions. Probably the best method is to insert a looped rope in the mouth and raise the head by this means, thus leaving the lower jaw free.

If a bottle be used to administer the drench, it is wise to wrap a piece of cloth around the neck and tie with cord.

Enemas.

Probably the most effective method of giving an enema is to use a piece of rubber hosing without any nozzle and connect it to a water supply. The hose is first taken in with the hand as far as possible, then after the tap is turned on and a few gallons of water introduced, it will be found that the hose can be worked in farther for a total distance of 4 to 6 feet. Quantities of water are passed whilst this procedure is going on, but a considerable quantity is retained, and will even run forward. This method is particularly advantageous in cases of sand and impaction colics. Failing this method, a piece of hose is connected to a force pump, and several gallons of soapy water introduced.

CORRECTION

In this *Journal* for December, 1933, in an article on the Better Farming Train it was stated that the Friesian cow and bull carried on the train on its Western District Tour were "champions respectively in their classes at the recent Royal Agricultural Show." Instead of the word "champions" the word "winners" should have been printed. The champion Friesian cow at the last Melbourne Royal was owned by Messrs. E. M. Smith and Sons, of Woodend.

Cereal Trials—1933

Results at Longerenong and Dookie

YIELDS of over 60 bushels per acre were obtained last year in the experimental plots conducted by the Department of Agriculture at Longerenong Agricultural College. These experiments, which have been conducted since 1912, have provided farmers on the Wimmera black soils with a reliable guide to the best practices of wheat farming.

The past season at Longerenong was a most favorable one. At no stage during the year was growth materially checked, and some high yields were obtained, the average return from the variety trials being 52 bushels per acre.

The wheat variety trials, which were designed to compare the yielding capacity of thirteen varieties, were sown on fallow at the end of June with 75 lb. of seed and 1½ cwt. of super per acre. In order that an accurate comparison could be made between the varieties under test, the thirteen wheats were sown in plots, side by side. Five sets of these plots were sown. This was done to give greater accuracy, since the average yields obtained from the five plots of each variety allow for any unavoidable variations in the soil.

The highest yield last season was given by the crossbred, Canberra X Hard Federation, which returned 61.4 bushels per acre. Next in order came Nizam, 57.8 bushels; then Free Gallipoli, 55.7; Wannon, 54.6; Federation, 54.4; Ghurka, 52.6; Ranee 4H, 52.4; Wandilla, 51.4; Sepoy, 50.5; Rajah, 50.3; Mogul, 47.8; Nabawa, 47.4; and Penny, 45.6 bushels per acre.

The average results of the variety trials over a number of years are shown in Table I., which should be regarded as a reliable guide to the comparative values of the varieties listed.

The variety Ghurka, which has given the highest average yield over a period of years, has proved very satisfactory on the black ground. It is a free stripping variety, mid-season to late in maturity, and its comparatively short, sturdy straw is of advantage in the rich soils, where crops frequently grow too tall and lodge with adverse weather at harvest. The variety Free Gallipoli, which has given the second highest average yield, is also a mid-season wheat, and has proved popular on large areas of the Wimmera. Nizam, which has given very similar returns, is a short strawed mid-season wheat, which was bred at Longerenong, and has shown itself to be well suited to the conditions there. The crossbred Canberra X Hard Federation, which topped the yields in 1933, has not given consistently high returns, and therefore has not been recommended to farmers.

TABLE I.

Variety.	Average Yield 7 Years (1927–33).	Average Yield 4 Years (1930–33).
	Bushels per acre.	Bushels per acre.
Ghurka	37·2	47·2
Free Gallipoli	36·9	46·6
Nizam	36·9	46·2
Wannon	36·1	45·7
Canberra and Hard Federation	..	45·7
Mogul	35·4	43·6
Federation	34·9	44·7
Nabawa	..	38·3

A replicated trial was conducted with a number of new crossbreds also. Among the most promising were the following (the figures in brackets indicating the amount in bushels per acre, by which these crossbreds exceeded the yield of the control variety, Federation):—Rajah X Gallipoli (4.6); Sepoy X Gallipoli (3.4); Gallipoli X Nizam (2.8).

Manurial Trials.

The permanent manurial trials, which have been conducted since 1912, provide valuable evidence of the results produced by the continued use of various fertilizers over a long period of years. The experiments have been conducted on three sites, which were sown in

Manurial Trials at Longerenong.

a three-course rotation, fallow—wheat—oats. The wheat plots were manured with various fertilizers, but the oats following were sown without manure. Of the many manures tested, superphosphate has proved to be the only one to produce profitable increases in yield, and Table II. gives the yields obtained from plots treated with quantities of superphosphate ranging from ½ cwt. per acre to 2 cwt. per acre. Contrasted with these is the return from the plots which have not been manured.

TABLE II.—WHEAT MANURIAL TRIALS: LONGERENONG.

—	Yield, 1933.	Average Yield 22 Years.	Increase over No Manure.
	Bushels per acre.	Bushels per acre.	Bushels per acre.
No manure	43·8	33·8	..
Super. ½ cwt. per acre ..	49·4	37·1	3·3
„ 1 cwt. per acre ..	50·8	38·3	4·5
„ 2 cwt. per acre ..	50·0	39·3	5·5

These results show that, under conditions similar to those at Longerenong and with the present low prices for wheat, applications of superphosphate in excess of ½ cwt. per acre are not warranted.

OAT VARIETIES.

The oat variety trials were sown without manure on stubble ground during the second week of May, 60 lb. of seed per acre being used in each case. The yields shown in Table III. show that during the past year the standard variety, Algerian, was the most suitable for grain production on the Wimmera soils.

TABLE III.—OAT VARIETY TRIALS.

Variety.	Yield.
	Bushels per acre.
Algerian	28·6
Palestine	28·1
Lachlan	27·9
Gidgee	27·6
Burt's Early	27·3
Mulga	26·5
Belar	24·0
Dawn	23·7

TRIALS AT DOOKIE.

At the request of the Council of Agricultural Education, the Department of Agriculture last year undertook the conduct of the cereal trials at Dookie Agricultural College. Operations for the first year consisted principally of amplifying the breeding and selection work previously carried out at the college, and the conduct of an accurate variety trial to determine the relative merits of the standard wheats of the district. The permanent manurial trial with wheat sown on fallow was also continued.

The variety trial, which was located on a good red loam, characteristic of a large portion of the surrounding district, was sown on 7th June with 75 lb. of seed and 1½ cwt. of super.

per acre. In order to avoid soil variations, the varieties were sown in blocks, each of which was repeated five times. The average yields are shown in the accompanying table.

WHEAT VARIETY TRIAL.—DOOKIE.

Variety.	Average Yield 1933.
	Bushels per acre
Baldmin	39·5
Major	39·3
Ghurka	39·0
Canberra × Hard Federation ..	38·3
Free Gallipoli	37·6
Ranee 4 H	35·9
Joffre	35·9
Nabawa	35·6
Castor	35·3
Bald Early	34·8
Carrabin	29·8

Baldmin and Major, which gave the highest yield during 1933, were both bred at Dookie, and have shown themselves to be well suited to the conditions prevailing there last year. Baldmin is a tall strawed, early maturing wheat, while Major is a late maturing variety, which has given satisfactory yields in the higher rainfall districts of the wheat belt. Closely following on these, the variety Ghurka, which was bred at the State Research Farm, Werribee, has given high returns, and in the average results of the trials conducted during the previous years gave the highest yields of all the varieties tested. It is a short strawed mid-season to late wheat, with a brown chaffed compact head, which threshes well. Carrabin, an importation from Western Australia, has not shown itself to be suited to the soil and climatic conditions at Dookie during 1933.

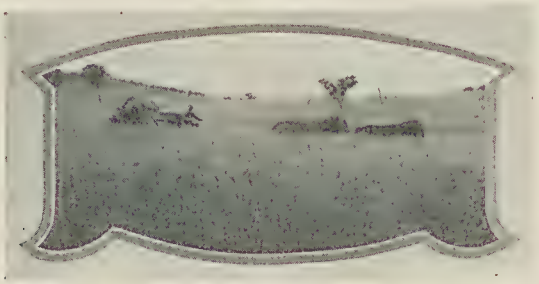
In addition to this trial, many other plots of new crossbred wheats and oats were sown. Promising results were given by some of these, viz., Major X Ranee, Currawa X Major X Gallipoli, and Major X Gallipoli, and these will be tested further next year.

The manurial trial, which has been conducted since 1926 on a wheat fallow rotation, has shown that material increases in yield can be obtained by the use of superphosphate. The average results indicate that the most profitable application was about 1 cwt. per acre. Increases in yield have been obtained with applications of lime and gypsum, but with wheat at present prices farmers in the Dookie district are not advised to apply these materials.

The accompanying table sets out the results obtained in 1933, together with the average figures for the past eight years.

MANURIAL TRIAL: DOOKIE.

—	Yield 1933.	Average Yield 8 Years.	Increase over No. Manure.
	Bushels per acre.	Bushels per acre.	Bushels per acre.
No manure	27·0	19·1	..
Super. ½ cwt. per acre ..	27·4	23·3	4·2
,, 1 cwt. per acre ..	31·3	24·8	5·7
,, 1½ cwt. per acre ..	35·0	26·1	7·0
,, 2 cwt. per acre ..	36·5	25·2	6·1
Super. 1 cwt. + pot. sulph., ½ cwt. + nitrate of soda, ½ cwt. per acre ..	30·2	24·4	5·3
Super. 1 cwt. + pot sulph., ½ cwt.	32·2	25·1	6·0
Super., 1 cwt. + lime, 10 cwt. (every year) ..	36·3	28·8	9 7
Super., 1 cwt. + gypsum, 10 cwt. (every year) ..	34·8	28·0	8 9



Stanhope Lucerne Competition

Report of the Judges—Messrs. J. Barrett (Closer Settlement Commission) and E. T. Beruldsen, B.Sc., Agr. (Department of Agriculture).

THE rapid extension of the area sown down to mixed pastures in the Stanhope district, and the justifiable interest taken in the development and progress of these pastures are perhaps tending to distract attention from the great importance of lucerne as the most valuable supplement to the grazing areas. Probably part of the success achieved with mixed pastures has been due to the fact that in most instances lucerne preceded the pasture. Lucerne is invaluable as a pioneering crop; its roots have a sub-soiling effect and this favours succeeding crops through the better absorption of water. Also, in common with other legumes, lucerne enriches the soil by the storing up of nitrogen through the agency of bacteria in nodules on the roots.

The Stanhope district is favoured in that a high proportion of the land is suitable for lucerne growing, and, if the quality of the stands exhibited in this competition is any criterion, very high yields of lucerne must be obtained generally.

All the paddocks exhibited had been regularly top-dressed with superphosphate, and in this report it is hardly necessary to stress the value of top-dressing. Unfortunately, financial stringency forced some farmers to withhold superphosphate from their lucerne and pastures during the past twelve months. Where top-dressing has been regularly carried out for a number of years, not unnaturally it is expected that very little harm will be done during the temporary suspension of the practice. That actual deterioration occurs was well demonstrated in one instance. Mr. E. Collins exhibited a paddock of nine acres, which had been regularly top-dressed for some years, and only half of which had been top-dressed this year. The half which had been treated was easily distinguished from some distance, and was definitely superior to the remainder.

In one or two instances, there was evidence that some improvement could have been effected in the watering method. In ground which does not absorb water readily and where fairly wide intervals occur between waterings in the middle of summer, it is usually advisable to give a supplementary watering one or two days after each irrigation with the object of attaining a better penetration.

Generally, the paddocks exhibited were being cut for hay, and grazing was the exception. When cut and not grazed, the longevity of a lucerne stand is increased, and the intrusion of inferior fodder plants and weeds is not marked. Weeds were almost negligible in the lucerne stands inspected, and this reflected the good management of those concerned, especially with regard to top-dressing, the vigorous growth of the lucerne suppressing weed growth. The few weeds noted consisted mainly of "windmill grass" (*Chloris sp.*) and "flat-weed" (*Hypochaeris spp.*).

Ten paddocks were entered in the competition and the details of the awards are as shown in the accompanying table.

The winning lucerne stand of 8 acres exhibited by Messrs. Brock Bros. was sown in September, 1932, on the site of an old lucerne stand. No period of fallow intervened between the ploughing up of the old stand and the establishment of the new. Seed was sown at the rate of 10 lb. per acre with 90 lb. of superphosphate; half the quantity of seed and manure was sown in one direction and the remaining half at right angles. One bag of superphosphate per acre was applied in November, 1933.

At the time of inspection, two heavy cuts of hay had already been harvested this season, the second cutting having taken place three weeks previously. The lucerne was just commencing to bloom, and a dense and very heavy uniform crop of high quality hay was promised. Very few weeds were in evidence, and the condition of the channels and provision for drainage left very little to be desired. The paddock is watered at approximately fortnightly intervals in the middle of summer.

Mr. A. E. Enders exhibited two five-acre paddocks, which had been cropped with cereals for many years before being sown to lucerne. The area was ploughed in July, 1932, graded, and sown in the following October with 10 lb. of lucerne seed and 1 cwt. of superphosphate per acre. One bag of superphosphate per acre was applied in November, 1933. The area was grazed last year, but was cut this year. The third cut for the season was inspected. Very little difference between the two paddocks was noted. In No. 1 paddock, however, the lucerne was rather mature and a few weeds were in evidence. Paddock No. 2 was practically free from weeds. The uniformity of the stand was marred by a few patches where growth was not so vigorous, but no "burnt out" patches were in evidence.

Sheep on irrigated Lucerne.

A paddock of 12 acres was exhibited by Mr. O. Ussher. The land had previously been devoted to cereal cropping. Sowing of the lucerne was carried out in August, 1929, with 6 lb. of seed and 1 bag of superphosphate per acre. The lucerne was in full bloom, and this detracted from the quality. Some idea of the excellent growth can be gained from the fact that, although 30 cows had been grazing in the paddock for a week, very little apparent impression had been made. Mr. Ussher grazes his lucerne, the dairy cows being followed by sheep. Cleaning up the paddock with the mower after the stock have been removed is a regular practice. The lucerne is watered once a fortnight in the middle of summer, and except during 1931, the paddock has been top-dressed annually for many years; up to a bag of superphosphate per acre was applied each year.

In conclusion, the judges would like to draw the attention of competitors to the fact that their duties were rendered somewhat difficult by the fact that the exhibits were presented in almost every stage of growth. Some competitors were at a disadvantage through having had to reserve their lucerne till the day of judging, by which time it was too mature. Other exhibits were not far enough advanced in growth. To some extent this difficulty would be obviated by a more definite date for judging being stipulated, in which case, by a little judicious management, intending competitors could endeavour to have their lucerne presented at an ideal stage of growth.

Details of Awards.

Exhibitor.	Lay-out for Irrigation. Condition of Channels and Provision for Drainage. (20)	Estimated Yield. (20)	Quality of Hay Crop would Produce. (20)	Uniformity. (20)	Freedom from Weeds. (20)	Total. (100)
1. Brock Bros.	18½	19½	19	18½	19½	95
2. A. E. Enders, Exhibit (2)	18	18½	17½	18	20	92
3. A. E. Enders, Exhibit (1)	18	18	17	18	19½	90½
4. O. Ussher	17	18	17	18	19	89
5. J. Stillman	17	18	18½	16	19	88½
6. G. Kennedy	17	17½	16	17	18½	86
7. W. Chancellor	18	18	15	16	18	85
7. E. Collins	17	15	18	17	18	85
7. H. Gardner	17	15	17	17½	18½	85
8. C. Hick	16	16	17	17	17	83

Orchard and Garden Notes

By Edward E. Pescott, F.L.S.

Iris stylosa.

The Flower Garden.

THE mauve-coloured Iris, known as Iris stylosa, which is now beginning to bloom, is one of the most useful and most popular of autumn and winter flowers. It is an exceedingly free-flowering plant and easy to grow. It somewhat resents a shift; if plants are to be moved, the work should be done as soon as the flowering season is over.

Immediately the first bud is noticed, the foliage may be cut down, so as to allow a better development of the flowers, the petals of which are very delicate and easily torn. In the case of the Iris stylosa, the removal of the foliage at this stage does no injury. When the foliage has been cut, a good lime dressing should be worked into the plant, to check attacks of slugs and snails; then the flowers will come freely. To obtain the best results, the buds should be gathered before opening.

Sowings of all annual seeds such as Poppies, Antirrhinum, Primula, Pansy and others should be delayed no longer, as well developed plants must be obtained before the cold weather sets in.

Camellia, Rhododendron, Paeony, Magnolia and Azalea plants should now have a top-dressing of cow manure, or a very weak dressing of blood manure to help them to develop fully their now maturing buds.

All Palms and other pot plants should be washed with nicotine sulphate or strong soap suds to clean scale and mealy bug from the foliage.

The Orchard.

Even though it is the busy season of picking and packing, fallen fruit should not be allowed to remain too long on the ground. It is dangerous to bury this fruit, even deeply. Spores of black spot, shot-hole, brown rot and other fungous diseases abound on such fruits further, Codling moth, peach moth, scales and other insects in some stage of development, may be present. Either boiling or burning is the only safe method of dealing with fallen fruit. Late infestations of the pear slug are occurring everywhere. This pest has been very prevalent during the present season. It will be well to spray trees, whenever the pest is noticed, with an arsenical or an oil spray. Hawthorn trees and hedges should also be examined for this insect.

The importance of lures is again emphasized, especially in relation to the time to spray for Codling moth. One grower at Blackburn, who had already caught many thousands of moths in his lures, found the time approaching for his late spray, yet no moths were appearing in the lures. After waiting for several days, moths began to appear, and spraying was at once resorted to. Had the grower sprayed at his usual time, he would have been at least a week too early, and most of his efforts would have been lost.

[*Continued on page* 145.

Professional Papers

[This section is devoted to professional papers and articles of a scientific character.]

The Green Peach Aphid (*Myzus persicae Sulzer*) in relation to the Peach in Victoria, and the Measures investigated for its Control.—Part II.

By Keighley M. Ward, B.Agr.Sc.; Assistant Entomologist.

Part I. of this paper appeared in the February issue of the Journal

C.—Observations on Metamorphosis and reproduction.

IT has not been possible to study the influence of temperature and humidity on the aphid under controlled conditions. Breeding was carried out in a wire-screened insectary and records were kept of atmospheric temperature and humidity during the period of the observations. The forms of the aphid reared were those which occur on peach trees in Spring and Autumn.

Method of Breeding.

All individuals were reared in isolation. In 1932 the spring generations were bred in a micro cage of the type shown in Plate 6. This type of cage has been used by Mr. J. G. Bald, Waite Institute, Adelaide, for breeding thrips. The cage consists of a small glass tube attached to portion of a leaf on a young, potted peach tree. Each aphid is restricted to a small area of leaf and moulting, &c., can readily be observed. Under this method, however, the mortality of aphids was more than 50 per cent. and, therefore, in later experiments another method was adopted.

In 1933 each individual was reared on a young peach twig standing in water (see Plate 6a). Each twig pierces a black cardboard disc which serves the double purpose of preventing the aphid from falling to the bottom of the cage and of catching the cast skins which show up readily on the dark background. The whole is covered by a lamp chimney closed at the top with cheese-cloth.

Breeding of the spring forms was commenced in August and was continued until late December (1933). Observations were made daily at the same hour. Each aphid was transferred to a fresh twig every two or three days. The mortality under this method of breeding was about 10 per cent. The spring forms were reared through seven generations, complete records being kept for four of these. First and last-born individual were not always selected to be reared to maturity.

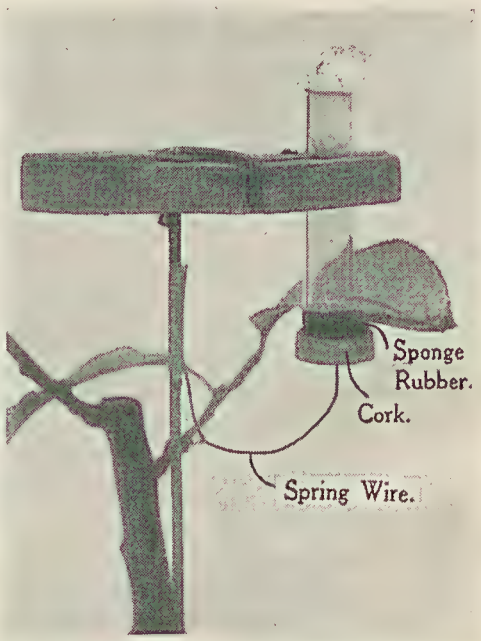


Plate 6.—Micro-cage for breeding small insects.

The breeding of the autumn form of the aphid (*oviparous female*) was carried out in April, May and June of 1933. This form was reared in the same manner as the spring forms, but on twigs bearing only one mature leaf each. The leaf was pinned down on to the cardboard disc so that when viewed from above the entire leaf was within the circumference of the disc. Winged autumn migrants (*viviparous females*) were used to initiate the experiments. They were taken from peach trees after the migration from the secondary host plants had been made, and each was placed on a peach twig and allowed to reproduce. The larvae born each day were transferred to fresh twigs. When each oviparous female reached maturity, a winged male aphid was placed in the cage and subsequently observations were made on oviposition.

Results.

The data gathered from these experiments are contained in Tables 1 and 2 and are taken from the observations made in 1933. The duration of each generation and the temperature and humidity conditions existing during the period of the observations are shown in Graphs 3 and 4.

Each aphid passes through a series of four ecdyses (moults) before reaching maturity. There are thus five instars—four nymphal and one adult.

The Autumn Generation.—There is only one complete generation of the aphid on the peach in Autumn viz., that in which the sexual, egg-laying female is produced. From Table 1 it is seen that the average length of *nymphal life* is two weeks, and this, (cf., Table 2) is a little longer than that of the forms comprising the second and later spring generations. The average length of *adult life* (5th instar) was longer than that of any other form of the aphid studied. One individual had an adult life of 35 days, and during an oviposition period of 23 days it deposited 13 eggs. This was the maximum number of eggs deposited by any individual during the experiments. This female lived for six days after depositing her last egg. *Oviposition* usually did not commence until at least one or two days after mating. The rate of deposition of eggs is irregular. For example, one female laid four eggs in eleven days; another produced seven eggs in a period of five days, five of them being laid in two days, Sometimes a period of ten days elapsed between the deposition of two successive eggs.

Plate 6a.—Micro cage used for breeding aphids.

The *total life* of the oviparous female is relatively long. The longest total life for an individual was 49 days. Unlike the viviparous females, which usually die within one or two

Table I.—Metamorphosis and Oviposition of Egg-laying Female (Autumn Generation).

Nymphal Life.					Adult Life.			Total Life.	
Length 1st Instar (days)	2nd Instar (days)	3rd Instar (days)	4th Instar (days)	Total Developmental period.	5th Instar (days)	Egg-laying period.	No. eggs deposited.		
3·3	3·2	3·3	4·3	14·1	22·8	8·1	7	37·0	
2–4	2–4	2–5	3–7	12–18	11–35	2–23	3–13	23–49	Range
31	31	31	31	31	17	17	17	17	No. observations

days of producing their last young, the oviparous forms may live for many days after depositing their last eggs. A number of individuals lived for from 10 to 17 days after they had ceased to produce eggs. The majority however died within five or six days.

The *eggs* were usually deposited on the peach twigs on which the aphids were bred, but often they were laid on various parts of the cage, e.g., on the cotton wool, the glass chimney or the cheese-cloth. As each egg was deposited it was carefully removed with a camel-hair brush and placed on a special card for purposes of observation. Immediately after an egg is laid it is light green in colour, but in the course of several days it changes through darker greens to a shining black. The average number of days required for this change was 3.6. The average length of the period between the laying and the hatching of an egg was 60 days, the range being from 55 to 65.

The Spring Generations.—Refer to Table 2. The *nymphal life* (i. e., developmental period) of the *fundatrix*, which hatches from the egg, is considerably longer than that of any other form of the aphid, the first instar in particular being much longer than any other nymphal instar. The reason for this unusually long first instar is not clear. The newly hatched larvae were placed on young peach twigs which already had young leaves on them (the twigs being taken from potted trees which had previously been slightly forced in a hothouse) so that food was readily available. It seems reasonable to assume that low temperatures during the early stages (av. 50 deg. F.) retarded the development of these forms to a certain extent.

With the fundatrix, as with the other viviparous forms studied, *reproduction* almost invariably commenced within 24 hours of the final ecdysis. The reproductive capacity of the fundatrix is slightly greater than that of viviparous females in later generations when the average total number of larvae born is considered. The greatest number of young produced by one fundatrix was 61 over a period of 27 days. The average number of larvae born per day over the whole of the reproductive period was 2.4, but reproduction is spasmodic, it being usual for groups of young of varying numbers to be born at irregular intervals. For example, the numbers of young produced by a typical fundatrix on 12 successive days were 3, 3, 0, 9, 0, 4, 2, 1, 6, 4, 1, 0. The *total length of life* of the

TABLE II.—METAMORPHOSIS AND REPRODUCTION OF SPRING GENERATIONS OF M. PERSICAE ON PEACH TWIGS.

Generation.	Nymphal Life.					Adult Life.					
	1st Instar (Days).	2nd Instar (Days).	3rd Instar (Days).	4th Instar (Days).	Total Devmtl. Period (Days).	5th Instar (Days).	Number Larvae Born per Day.	Total Number Larvae Born.	Reproductive Period (Days).	Total Life.	
1. (Fundatrix)	12·7	4·5	4·2	5·2	26·6	20·5	2·4	45·0	19·5	47·1	
	9–20	3–7	3–5	3–6	24–31	13–29	0–9	33–61	11–24	33–51	Range
	6	6	6	6	6	6	6	6	6	6	No. obns.
2. (Apt. v. ♀) ..	3·0	2·4	3·1	3·9	12·4	16·1	2·6	39·2	15·6	28·5	
	2–4	1–3	2–6	2–6	10–16	8–32	0–7	22–91	6–32	18–42	Range
	28	28	28	28	28	16	16	16	16	16	No. obns.
3. (Apt. v. ♀) ..	2·1	2·3	3·0	3·1	10·5	16·3	2·0	32·7	15·7	26·8	
	1–4	1–5	2–6	2–6	9–13	8–27	0–9	12–80	8–26	18–39	Range
	39	39	39	39	39	38	39	39	39	38	No. obns.
Winged form ..	2	2	3	5	12	Did not reproduce normally on peach twigs					
Intermed. form ..	2	2	3	3	10	..	2·1	25	12	Killed prematurely	
4. (Apt. v. ♀) ..	2·4	2·4	2·4	3·2	10·4	14·7	2·4	31·7	13·2	25·1	
	2–4	2–4	2–3	2–4	9–12	10–24	0–8	17–74	8–23	21–33	Range
	20	20	20	20	20	12	13	13	13	12	No. obns.
Winged form ..	2	3	2	3	10	Did not reproduce normally on peach twigs.					

fundatrix was considerably greater than that of other spring forms, the maximum being 51 days.

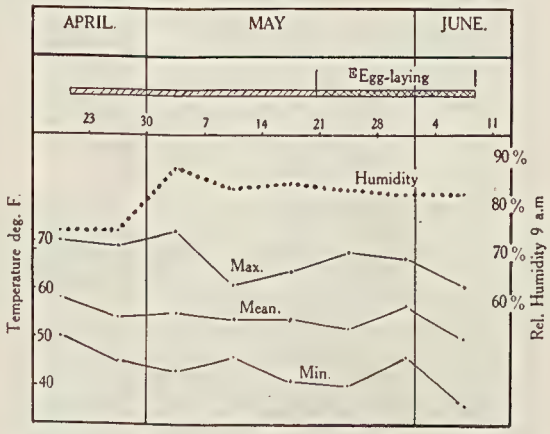
All aphids in the second generation reached maturity and commenced to reproduce in a much shorter period than did the fundatrices. Some individuals were very prolific, one aphid producing 91 larvae in 32 days, another 77 in 30 days. No winged forms developed in this generation.

In the third and fourth generations the *nymphal life* again was short, and a number of individuals reached maturity only 9 days after birth. Among these was a number of aphids whose first or second instar was of only one day's duration. Reproduction was irregular, as before, sometimes as many as nine larvae being born in one day while in other days no larvae were produced. Many aphids were able to reproduce rapidly for a number of successive days; thus, one individual's progeny on seven consecutive days were 4, 4, 6, 3, 5, 3, 6, and another's 4, 2, 4, 5, 5, 6, 6. On the other hand there may be periods when few young are born especially toward the end of the reproductive period or during cold spells of weather. Thus during the last five days of one aphid's life, the numbers of young produced were 1, 0, 1, 0, 1. The greatest number of larvae produced by an individual in these generations was 80 in a period of 23 days.

The average *total length of life* in the third and fourth generations was 26 days, with a maximum of 39 days.

Wing Production.—In the third generation, of 86 aphids reared to maturity only one individual became winged and one intermediate form was produced. The latter, when adult, bore the rudiments of two pairs of wings on the thorax, but its body outline closely resembled that of the wingless individuals. It reproduced quite normally on peach twigs (see Table 2) and its progeny developed into wingless forms. It was killed prematurely and mounted for description. In the fourth generation only one winged form arose out of 45 reared to maturity. A number of nymphs of the fifth generation were not transferred regularly to fresh twigs, but were left on the original twigs for seven days before being transferred. Fifty per cent. of these became winged, whilst those kept on fresh twigs were wingless. All members of the next two generations (sixth and seventh), which were regularly transferred to fresh twigs, did not produce wings. It is thus apparent that the generation in which winged forms are produced is not determined by inheritance, but that the condition of the food plant is important in this connexion. It was formerly believed that most or all members of the third generation became winged.

In the Burnley peach orchard, which is very close to the insectary where the breeding experiments were carried out, winged forms had developed on the trees by 1st October, but adult wingless females were present until 28th December. This indicates that in the field, winged forms may arise in both early and late generations.



Graph 2.—Temperature and humidity conditions during the breeding of the autumn generation of M. persicae.

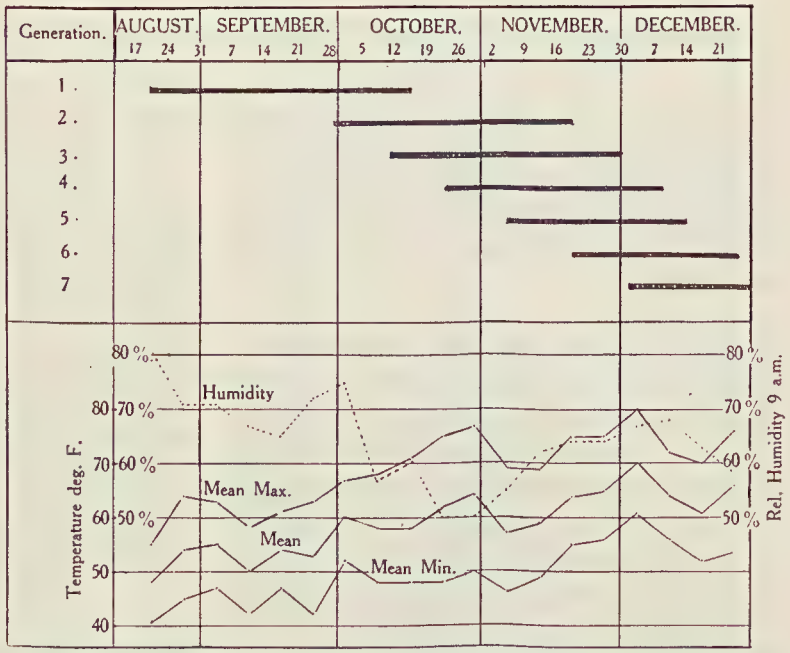
Temperature and Humidity Conditions.—The average temperature and humidity for each week during the period of the observations are shown in Graphs 2 and 3. The actual duration of each generation is also indicated in the graphs.

Conditions during the breeding of the autumn generation were:—extreme temperature range 36 deg. F. to 70 deg. F.; average daily temperature 50 to 58 deg. F.; average relative humidity 82 per cent. The average range of temperature during oviposition was 50 to 57 deg. F., the extreme range being from 36 to 68 deg. F.

The extreme range of temperature during the breeding of the spring generations was from 34 to 96 deg. F.; the average daily temperature ranged from 43 to 76 deg. F. Relative humidity (9 a.m. readings) was from 50 per cent. to 81 per cent.; average for whole period 64 per cent. Both temperature and humidity conditions varied much more widely during the

breeding of the spring forms of the aphid than they did during the breeding of the autumn forms.

The effect of fluctuations in temperature on both the rate of development of the larvae and the rate of reproduction of the adults was most marked during the breeding of the spring forms. Thus cool spells of weather were almost invariably accompanied by a slowing-down, and warm spells by a corresponding speeding-up of the rates of development and reproduction. Graph 4 shows the general tendency for the rate of reproduction to vary directly with temperature.



Graph 3.—Duration of each generation of* M. persicae, *and temperature and humidity conditions (weekly averages) during breeding experiments.

DESCRIPTION.

The following descriptions of the principal forms of the aphid have been made from specimens which were bred in the insectary, each insect being reared in isolation. For description, specimens of each instar in each generation were mounted either in Canada balsam after dehydration, &c., or in de Faure's fluid. In most cases the insects were examined and measurements made within a day or two of mounting. The various forms are described in the order in which they occur in the insect's life-cycle. The characters are considered in the following order:—1. Colour characters; 2. Morphological characters; 3. Measurements.

FUNDATRIX.

1st Instar.

1. Body, legs, antennae dull green, approaching olive green; a yellowish, oily material is usually present throughout the body. Eyes deep brown.
2. *Antennae.*—Slightly more than half length of body; five segments; one sensorium on distal extremity of IV., and group of sensoria at base of unguis on V. *Antennal tubercles* not developed. *Vertex*—slightly rounded outwards. *Eyes*—relatively few facets, approx. 20. *Rostrum*—extends a little beyond 3rd coxae.
   Cornicles short and thick. *Cauda* broad and blunt, only slightly developed.
3. *Antennae.*—Segments I., 44μ; II., 41μ; III., 75μ; IV., 69μ; V., base, 61μ; unguis, 109μ. Total, 399μ.
   Cornicles.—61μ.
   Body.—Length (ant. tubercles to tip of cauda), 761μ; breadth, 352μ.

2nd Instar.

1. Body lighter green than in 1st instar; legs and antennae faintly brown. Reddish to orange patches throughout body.
2. *Antennae.*—Less than half length of body; 5 segments; sensoria as in 1st instar. *Ant. tubercles* slightly developed. *Vertex* almost flat. *Rostrum* extends to 3rd coxae. *Cornicles* cylindrical. *Cauda* as above.
3. *Antennae.*—I., 50μ; II., 43μ; III., 111μ; IV., 85μ; V., base, 61μ; unguis, 105μ. Total, 455μ.
   Cornicles.—99μ.
   Body.—Length, 1016μ; breadth, 554μ.

3rd Instar.

1. Colouration as in 2nd instar. Distal extremities of appendages tend to be dusky.
2. *Antennae.*—About half length of body; 5 segments; III., IV., and V. imbricated; sensoria as in 2nd instar. *Ant. tubercles* not prominent. *Vertex* between tubercles slightly raised. *Rostrum* does not extend as far as 3rd coxae. *Cornicles* cylindrical, imbricated.
3. *Antennae.*—I., 58μ; II., 48μ; III., 193μ; IV., 111μ; V., base, 91μ; unguis, 134μ. Total, 635μ.
   Cornicles.—152μ.
   Body.—Length, 1341μ; breadth, 762μ.

4th Instar.

1. Colour characters approaching very closely to those of adult.
2. *Antennae* 5 segments; less than half length of body; III., IV., and V. imbricated; sensoria and ant. tubercles as in previous instars. *Rostrum* extends as far as 2nd coxae.
   Cornicles cylindrical, with slight flange. *Cauda* conical, broad at base, pointed.

3. *Antennae.*—I., 69μ; II., 55μ; II., 232; IV., 114μ; V., 95μ (base); unguis, 149. Total, 714μ.
   Cornicles.—230μ.
   Body.—Length, 1689μ; breadth, 896μ.

5th Instar (Adult).

1. General body colour variable; from pale green with reddish or orange coloured material occurring throughout body irregularly, to entirely red. Intermediate forms with both green and red (or pink) colouration are common. *Antennae,* legs pale green with distal extremities somewhat dusky. *Cornicles* pale green. *Eyes* deep brown.
2. *Apterous.*—Antennae 5 segments; less than half length of body; III.-V. imbricated, and carrying a few inconspicuous hairs; one sensorium on IV. near distal extremity, usual group of sensoria at base of unguis on V. *Ant. tubercles* not prominent, diverging; *vertex* between tubercles almost flat, slightly protruding. *Eyes* numerous facets; ocelli absent. *Rostrum* extends as far as 2nd coxae. *Cornicles* cylindrical, broadening a little at base; imbricated. *Cauda* conical, rounded at apex, slightly constricted toward centre, carrying a few, long, curved hairs. *Legs* slender, numerous hairs on tibiae.
3. *Antennae.*—I., 77μ; II., 57μ; III., 315μ; IV., 145μ; V., (base), 111μ; unguis, 165μ. Total, 870μ.
   Cornicles.—340μ.
   Cauda, 179μ.
   Body.—2007μ x 1099μ. (Ant. tubercles to tip of abdomen).
   Hind tibiae.—766μ.

NOTE.—The body measurements, particularly of 4th and 5th instar forms, are only approximate since a slight amount of distortion occurs with mounted specimens. The figures given are most likely to be slightly exaggerated.

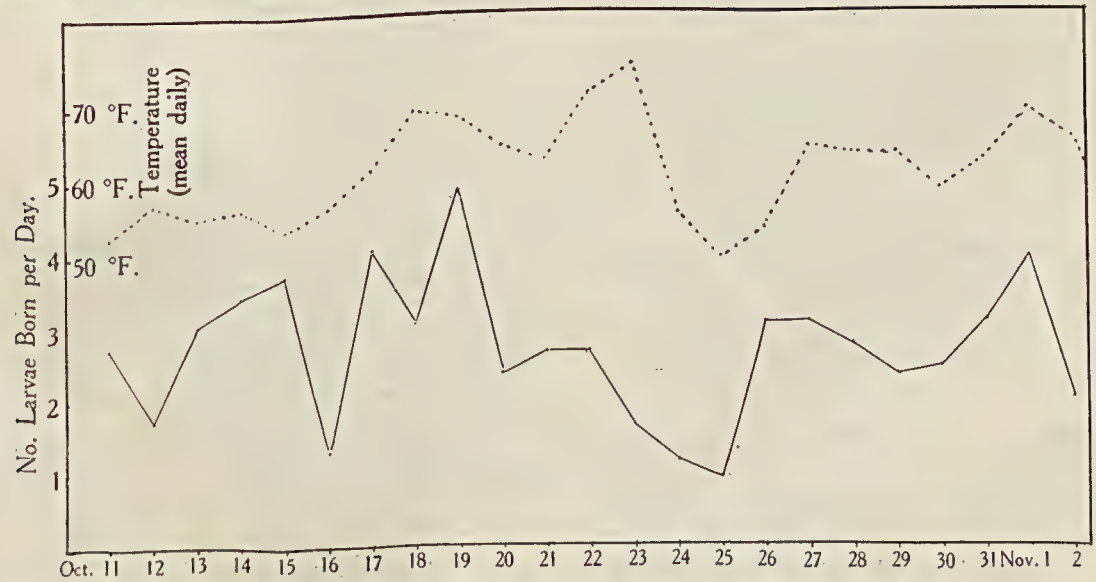
APTEROUS VIVIPAROUS FEMALE (SPRING FORM).

1st Instar.

1. Body pale green; legs, antennae, and cornicles very light brown, somewhat dusky toward apices. Eyes red.
2. *Antennae* 5 segments; about two-thirds length of body; III., IV., and V. imbricated, III. and IV. only faintly; IV. with distal sensorium, V. with group of sensoria at base of unguis. *Ant. tubercles* distinct. *Vertex* between tubercles slightly protruding. *Eyes* about 15 facets. *Rostrum* extends as far as 3rd coxae. *Cornicles* short, thick, slightly constricted and flanged at apex. *Cauda* fairly well developed; short and rounded. *Legs* with few short hairs; hind tibiae with longer hairs on distal portion. Tarsi faintly imbricated.
3. *Antennae.*—I., 51μ; II., 42μ; III., 89μ; IV., 66μ; V., base, 56μ; unguis, 163μ. Total, 467μ.
   Cornicles.—81μ.
   Body.—Length (ant. tubercles to tip of cauda), 769μ; breadth, 340μ.

2nd Instar.

1. Body pale green. Legs, antennae, cornicles very pale; legs and antennae slightly dusky at apices. Eyes deep red.
2. *Antennae* 5 segments; III., IV., and V. imbricated; sensoria as in 1st instar. *Ant. tubercles* and *vertex* as in 1st instar. *Rostrum* extends slightly beyond 2nd coxae. *Cornicles* more elongated than in 1st instar. *Cauda* blunt and rounded.
3. *Antennae.*—I., 62μ; II., 47μ; III., 163μ; IV., 93μ; V., base, 70μ; unguis, 195μ. Total, 630μ.
   Cornicles.—143μ.
   Body.—Length, 1178μ; breadth, 563μ.



Graph 4.—Showing relationship between temperature and rate of reproduction.

3rd Instar.

1. Colour characters as in 2nd instar.
2. *Antennae* 6 segments. III.-VI. imbricated. *Ant. tubercles* more prominent than in previous instar. Sensoria as before. *Rostrum* extends as far as 2nd coxae. *Cornicles* and *legs* more slender than previously.
3. *Antennae.*—I., 67μ; II., 57μ; III., 133μ IV., 122μ; V., 122μ; VI., base, 86μ; unguis, 244μ. Total, 831μ.
   Cornicles.—191μ.
   Body.—1524μ.

4th Instar.

1. Body and appendages light green. Ant. faintly dusky at distal extremity. Tarsi dusky. Three green longitudinal markings on dorsal surface. Eyes deep red.
2. *Antennae* about half length of body; sensoria as in previous instars; III.-VI. imbricated. *Ant. tubercles* fairly prominent. *Vertex* protruding. *Rostrum* extends to 2nd coxae. *Cornicles* cylindrical, slightly tapering. *Cauda* broadly conical, pointed. Tarsi imbricated.
3. *Antennae.*—I., 81μ; II., 65μ; III., 221μ; IV., 168μ; V., 160μ; VI., base, 99μ; unguis, 270μ. Total, 1064μ.
   Cornicles.—285μ.
   Body.—Length, 2026μ; breadth, 1056μ.

5th Instar.

1. Body light green with three longitudinal lines of slightly darker green on dorsal-surface (one central, two lateral). Appendages paler green; ant. slightly dusky at apex; tarsi dusky. Eyes red to deep brown.
2. *Antennae* 6 segments; about two-thirds length of body; one sensorium at distal end of V., group of 5 or 6 sensoria at base of unguis; III.-VI. imbricated and with few scattered hairs; *ant. tubercles* prominent slightly converging; *vertex* between tubercles protruding; *ocelli* wanting. *Rostrum* extending as far as 2nd coxae. *Cornicles* long and slender, cylindrical, slightly tapering, imbricated, longer than III. *Cauda* conical with slight constriction at middle, finely spinose, armed on each side with long curved hairs. *Legs.*—hind tibiae longest; hairy, tarsi faintly imbricated.
3. *Antennae.*—I., 97μ; II., 65μ; III., 357μ; IV., 265μ; V., 217μ; VI., base, 116μ; unguis, 318μ. Total, 1435μ.
   Cornicles.—447μ.
   Cauda.—202μ.
   Body.—2271μ x 1262μ.
   Hind tibiae.—1013μ.

Winged Viviparous Female (Spring Migrant).

Early instars (1st, 2nd, 3rd) practically the same as those of apt., viviparous female (spring forms), and it is therefore not necessary to describe these.

4th Instar.

1. General body colour light green; extremities of appendages dusky.
2. *Antennae* 6 segments; one sensorium near distal portion of V., usual group at base of unguis; III.-VI. imbricated. *Ant. tubercles* prominent, slightly converging. *Vertex* between tubercles pointed. *Eyes* deep red or brown; ocelli absent. *Rostrum* extends to 2nd coxae. *Cornicles* cylindrical, tapering toward apex, slightly flanged at apex, imbricated. *Cauda* conical, broad, and bluntly pointed. *Wing pads* prominent, free, extend slightly beyond 3rd coxae.
3. *Antennae.*—I., 81μ; II., 55μ; III., 275μ; IV., 221μ; V., 178μ; VI., 86μ (base), and 364μ (unguis). Total, 1260μ.
   Cornicles.—273μ.
   Body.—1523μ x 730μ.

5th Instar.

1. Head, thorax, segs. I. and II., brownish. Scutum, thoracic lobes scutellum, mesosternum dark brown to black. Abdomen darker green than of apterous female; dorsal surface with irregular, dark brown markings, and a large dark patch on posterior half of abdomen; no markings on sternum. Legs light green, distal portions of femorae and tibiae dark brown, tarsi dark brown. Cornicles, cauda, and tip of abdomen brown. Wing insertions light brown.
2. *Antennae* slightly longer than body, imbricated; 10-12 sensoria in a row on III. *Frontal tubercles* prominent, slightly converging; vertex protruding and carrying an ocellus. *Eyes* deep red; ocelli present, one on vertex, one at inner margin of each eye. *Cornicles* cylindrical, imbricated. *Cauda* conical, rounded at apex, slightly constricted at middle, and carrying several long, curved hairs on each side. *Wing* venation normal; 3 or 4 hooklets on costa of hind wing.
3. *Antennae.*—I., 81μ; II., 62μ; III., 446μ; IV., 383μ; V., 289μ; VI., 562μ;. Total, 1823μ.
   Cornicles.—308μ.
   Cauda.—171μ.
   Body.—1722μ x 796μ.
   Hind tibiae.—1233μ.

Intermediate Spring Form.

5th Instar. Described from a single specimen.

1. Colour characters resembling those of apt. vivip. female.
2. *Antennae* 6 segments; 6 or 7 sensoria in row on III., one sensorium at distal end of V., and usual group at base of unguis on VI. *Ant. tubercles* prominent, slightly converging. *Ocelli* absent. *Thoracic characters* resembling those of wingless form, but bearing rudiments of fore and hind wings which extend as far as 3rd coxae. Other morphological characters similar to those of apt. vivip. female.
3. *Antennae.*—I., 82μ; II., 60μ; III., 431μ; IV., 304μ; V., 222μ; VI., base 113μ, unguis 476μ. Total, 1688μ.
   Cornicles.—378μ.
   Cauda.—179μ.
   Body.—2079μ x 1059μ.
   Hind tibiae.—989μ.
   Wing rudiments (forewings).—426μ.

Winged Viviparous Female (Autumn Migrant).

Morphologically almost identical with the spring migrant; readily distinguished from the latter in that its cornicles are distinctly clavate. Specimens collected at Burnley were a little larger than the spring migrant.

Measurements—

Antennae.—I., 89μ; II., 72μ; III., 547μ; IV., 449μ; V., 352μ; VI., 705μ. Total, 2214μ.
Cornicles.—388μ.
Cauda.—179μ.
Body.—1925μ.
Hind tibiae.—1357μ.
Wing expanse.—7780μ.

Apterous Oviparous Female.

1st Instar.

1. Body pale green; appendages very pale.
2. *Antennae* 5 segments, approx. two-thirds length of body; IV. with distal sensorium. V. with group of about 7 sensoria at base of unguis. *Ant. tubercles* inconspicuous; vertex almost flat. *Eyes* with relatively few facets, red. *Rostrum* extends as far as 3rd coxae. *Cornicles* short and thick. *Cauda* blunt and inconspicuous.
3. *Antennae.*—I., 52μ; II., 41μ; III., 127μ; IV., 76μ; V., base 71μ, unguis 183μ. Total, 550μ.

   Cornicles.—114μ.

   Body.—801μ x 433μ.

2nd Instar.

1. Body pale green; appendages very pale, distal extremities faintly dusky.
2. *Antennae* 5 segments; slightly more than half length of body; sensoria as in 1st instar. *Ant. tubercles* evident, but not prominent. *Vertex* slightly protruding. *Rostrum* extending to 2nd coxae. *Cornicles* cylindrical, slightly tapering at apex, short and thick. *Cauda* as in 1st instar.
3. *Antennae.*—I., 59μ; II., 47μ; III., 157μ; IV., 96μ; V., 72μ (base), 216μ (unguis). Total, 647μ.

   Cornicles.—144μ.

   Body.—1115μ x 598μ.

3rd Instar.

1. Body usually slightly darker than in 2nd instar; sometimes pale reddish; extremities of legs and antennae dusky; cornicles dusky. Eyes red.
2. *Antennae* 6 segments, III. not always completely divided; sensoria as in previous instars. *Ant. tubercles* more prominent than previously. *Rostrum* extending to 2nd coxae. *Cornicles* cylindrical, slightly tapering. *Cauda* broad and blunt.
3. *Antennae.*—I., 70μ; II., 60μ; III., 125μ; IV., 148μ; V., 137μ; VI., base 99μ, unguis 238μ. Total, 877μ.

   Cornicles.—187μ.

   Body.—1328μ x 1697μ.

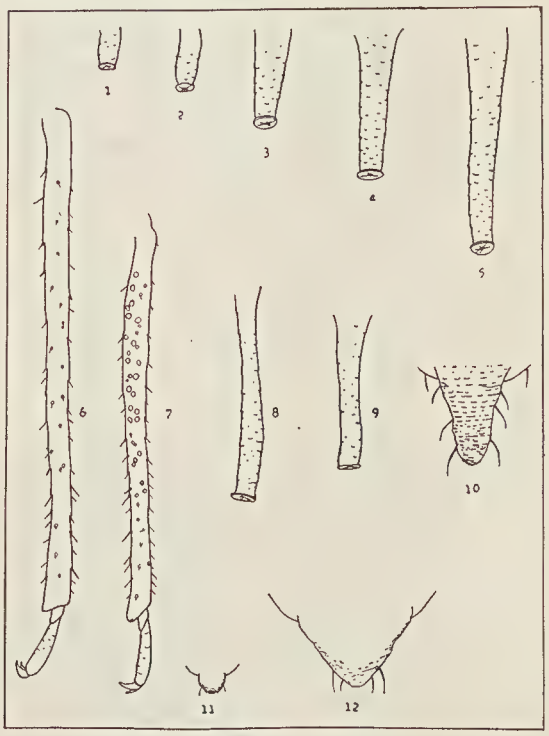


Plate 7.

1. Cornicle—ap. v. female; spring form; 1st instar. 2 Cornicle—ap. v. female; spring form; 2nd instar. 3. Cornicle—ap. v. female; spring form; 3rd instar. 4. Cornicle—ap. v. female; spring form; 4th instar. 5. Cornicle—ap. v. female. spring form; 5th instar. 6. Hind Tibia and tarsus of ap. v; female; adult. 7. Hind Tibia and tarsus of ap. ovip. female. 8. Cornicle—autumn migrant. 9. Cornicle—spring migrant. 10. Cauda—ap. v. female; adult. 11 Cauda—ap. v. female; 1st instar. 12. Cauda—ap. v. female; 3rd instar.

4th Instar.

1. Body immediately after ecdydis bright red, gradually changing to deep ferruginous red; sometimes lighter coloured and greenish. Eyes reddish-brown. Tarsi, distal extremities of tibiae and antennae dusky brown.
2. *Antennae* 6 segments, about two-thirds length of body; V. and VI. with usual sensoria. *Ant. tubercles* fairly prominent. *Vertex* protruding. *Rostrum* extending to 2nd coxae. *Cornicles* cylindrical, slightly tapering toward apex, imbricated. *Cauda* broadly conical.
3. *Antennae.*—I., 74μ; II., 63μ; III., 185μ; IV., 189μ; V., 177μ; VI., base 103μ, unguis 314μ. Total, 1105μ.

   Cornicles.—238μ.

   Body.—1768μ x 1015μ.

5th Instar. (Adult).

1. Body ferruginous red; legs, antennae cornicles and cauda reddish brown; hind tibiae brown. Eyes deep red.

2. Antennae 6 segments; about two-thirds length of body; V. with one sensorium near distal extremity; and VI. with usual group of sensoria at base of unguis; imbricated. *Ant. tubercles* very prominent, converging. *Rostrum* extending to 2nd coxae. *Cornicles* cylindrical, slightly flanged at apex. *Cauda* conical, rounded at apex, slightly constricted near middle. *Tibiae* of hind legs with numerous, small, sensory-like markings, 50-60.
3. *Antennae.*—I., 75μ; II., 63μ; III., 251μ; IV., 238μ; V., 204μ; VI., 419μ. Total, 1250μ.
Cornicles.—290μ.
Cauda.—136μ.
Body.—1939μ x 1099μ.
Hind tibiae.—805μ.
Egg.—629μ x 338μ.

WINGED MALE (AUTUMN MIGRANT).

5th Instar. (Adult).

1. Body on the whole darker than winged female (autumn migrant); abdomen without prominent markings, dark brown or black. Antennae darkish brown. Cornicles and cauda brown. Legs brown, distal extremities dusky.
2. *Antennae* a little longer than body; imbricated; III., with 30-40 or more sensoria, IV. 20-30 sensoria, V. with about 15 sensoria, one large sensorium near apex. VI. with usual group of sensoria at base of unguis. *Cornicles* cylindrical, imbricated, clavate. *Cauda* small, conical, rounded at apex, slightly constricted near middle. *Wing venation* normal. *Antennal tubercles* prominent, converging. *Vertex* protruding and carrying an ocellus; also an ocellus at inner edge of each eye.
3. *Antennae.*—I., 83μ; II., 72μ; III., 474μ; IV., 450μ; V., 375μ; VI., 739μ. Total, 2193μ.
Cornicles.—329μ.
Cauda.—120μ.
Body (length), 1475μ.
Wing expanse.—6420μ.

FORECASTING GENERAL OUTBREAKS.

It is generally recognized that climatic factors largely determine the relative abundance of an insect species in different seasons. Therefore, an examination has been made of meteorological data for the Goulburn Valley to ascertain whether an outbreak can be predicted on the basis of such data. Exact records of only two outbreaks have as yet been obtained, so that the range of observations is too short to form definite conclusions. The outbreaks occurred in 1928 and 1932. The former was

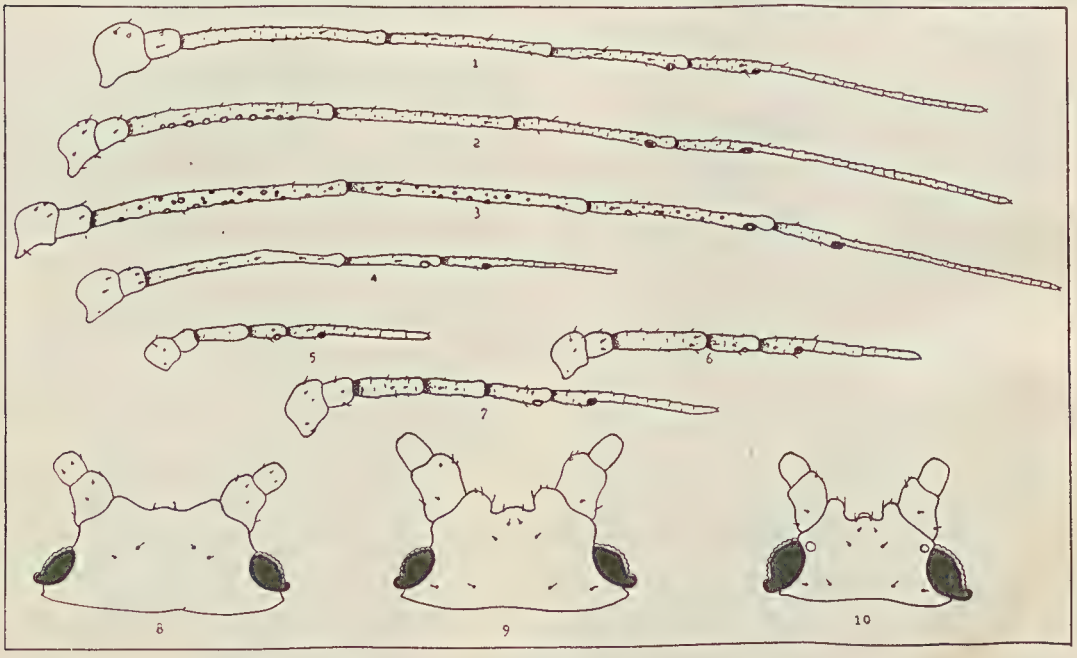


Plate 8.

1. Antenna—ap. v. female; adult; spring form. 2. Antenna—w. v. female; adult; spring form. 3. Antenna—w. male adult. 4. Antenna—Fundatrix; adult. 5. Antenna—ap. v. female; spring form; 1st instar. 6. Antenna—ap v. female; sprin; form; 2nd instar. 7. Antenna—ap. v. female; spring form; 3rd instar. 8. Head of Fundatrix; adult. 9. Head of ap. v. female; adult. 10. Head of w. v. female; adult

NOTE.—ap. v. = apterous, viviparous.
w. v. = winged, viviparous.

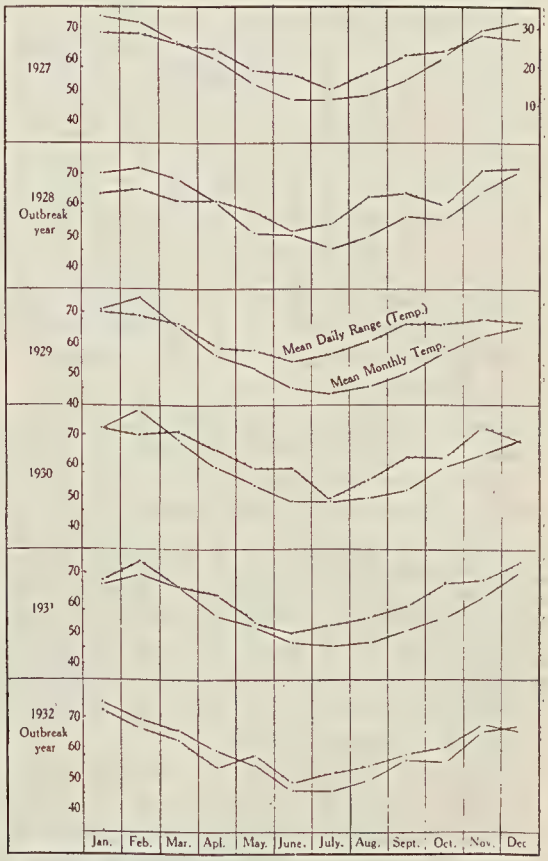
very severe and general for the whole State, while the latter gave rise to only a moderate, general infestation which was the heaviest since 1928.

The only weather records available for the Goulburn Valley are those from Dookie, which is within 20 miles of the irrigated areas, and lies in the same climatic region as Shepparton, where the observations on outbreaks were made. Records of temperature are available for Shepparton for the years 1931 and 1932, and a comparison of the average monthly temperatures of Dookie and Shepparton for these years shows that they are almost identical, the greatest difference in any monthly average being only 1.9 deg. F. Complete rainfall records are available for Shepparton and use has been made of these. The weather factors examined are average monthly temperatures, total monthly rainfall, and average daily temperature ranges for the years 1927 to 1932.

Conditions of temperature are shown in Graph 5. Comparing the average monthly temperature of the outbreak years (1928 and 1932) with those of normal years (1927, 1929, 1930, 1931), it is seen that the only outstanding difference between them is in the temperatures of September and October. In both 1928 and 1932 the average temperature for September was a little higher than usual, while that for October was lower than usual, and the average of October was slightly below that for September. It would thus appear that conditions are favorable for the insect if the average temperatures for both September and October are about 55 deg. F. The cooler conditions which prevailed in October, in both 1928 and 1932, were probably due to the absence of hot north winds, which occur frequently during this month in normal years. It is generally recognized in peach-growing districts that the occurrence of hot winds in Spring is the most important factor in suppressing or preventing an outbreak of the aphid. In the years in which the insects are relatively scarce, the average temperature for September is 51 deg. F., while that for October is about 58 deg. F.

It is also evident from the Graphs of average monthly temperatures that in the first six months of the year the variations in temperature are not correlated with the occurrence of the aphid later in the year.

The mean daily range of temperature (Graph 4) for the months of February, March, April and May, in 1928 and 1932 is from 20 deg. to 26 deg. F., whereas for the same months in the other four years under consideration it was, without exception, from 20 deg. to 30 deg. F. That is, during these four months in outbreak years the temperatures did not show such a wide variation between extremes as in



Graph 5.—Mean monthly temperatures and mean daily range of temperatures for Goulburn Valley (Dookie) 1927-1932.

normal years. During March, April and May, the winged migrants arise on the summer food plants, and it seems possible that the conditions just described for outbreak years are more favorable to their numerical increase (and consequently to the increase in numbers of the egg-laying forms on the peach) than those under which the daily temperature range is greater. In favorable autumn weather more migrants will arise than in unfavorable weather and possibly a low daily range of temperature is one of the deciding factors in this connexion. The greater the number of winged migrants which develop in autumn, the greater will be the number of egg-laying forms they give rise to.

From a careful study of the distribution of rain throughout the years 1927-1932, it would appear that no particular yearly incidence of rainfall is associated with outbreaks of the aphid.

According to Wardle(5), sap-feeding insects are relatively independent of the direct influence of atmospheric humidity. He points out that Headlee found in the case of *Toxoptera* (a genus of Aphididae), that this insect developed at the same rate at 80 deg. F., whether the relative humidity was 37 per cent., 50 per cent., 70 per cent., 80 per cent. or 100 per cent. In view of this fact and since it is possible that the relative humidity is not the same at Dookie as within the irrigated areas of the Goulburn Valley, the possible relation of humidity to an outbreak is not considered in the present paper.

The possibility of an aphid outbreak in Spring, will be increased if a heavy deposition of eggs occurs on peach trees during the previous Autumn, since large numbers of eggs on the trees provide a source for severe infestation. During the Autumn of 1932, the numbers of migrants and egg-laying females on peach trees in the Goulburn Valley were greater than in the two previous years, and eggs were more numerous. The Spring of that year witnessed the heaviest general infestation by the aphid since the epidemic of 1928.

From the foregoing it seems evident that a general outbreak of *M. Persicae* depends upon (i) the presence of fairly large numbers of eggs on peach trees throughout a district, and (ii) the occurrence of certain conditions of temperature in Spring. It is considered that the second factor is more important than the first and that unsuitable spring weather will prevent, or suppress, an outbreak regardless of the fact that numerous eggs had been deposited previous Autumn.

PARASITES AND PREDATORS.

The following is a list of species of Hymenoptera and various predatory insects which, during the course of field observations have been found to be associated with *M. persicae*. Large numbers of parasitized individuals of the aphid have been collected in the field and kept in the insectary pending the emergence of parasites.

Parasites.

Aphidius (*Ephedrus*) *persicae Frogg.* Braconidae. Localities collected—Burnley, Croydon, Goulburn Valley. This species emerged from fundatrices, apterous and alate females (spring and summer forms) and from oviparous females. Its period of activity extends from mid-September to May. This is by far the commonest parasite attacking *M. persicae* in Victoria.

Described by Froggatt, New South Wales Agricultural Gazette, XV. 1904, p. 611.

Allotria (*Hypodiranchis*) *Aphidae Frogg.* Cynipidae. Locality collected—Burnley. Active during Spring and Summer. Described by Froggatt, N.S.W. Gazette, XV. 1904, p. 612.

Lygocerus niger How. Ceraphronidae. Proctotrypoidea. Locality—Burnley. Active during October and November. Tillyard reports this insect as being an introduced species parasitic on *Aphis brassicae* (cabbage aphid) in Australia and New Zealand.

Alloxysta sp. Cynipidae. Collected at Burnley during October and November.

Predators.

Chrysopa ramburi Schiner. Neuroptera. Localities collected—Melbourne, Croydon, Doncaster and Goulburn Valley. Active throughout Spring, Summer and Autumn. Predaceous in larval stage only. Sucks body fluids from victims and discards remains.

Syrphus viridiceps Macquart. Syrphidae. Localities collected—Melbourne, Doncaster and district, Goulburn Valley. Active throughout Spring, Summer and Autumn. Predaceous in larval stage only. Sucks body fluids from victims and discards remains.

Larvae of *S. viridiceps* are parasitized by *Bassus laetatorius Fabr.*, an internal Ichneumon parasite. Previously recorded by Froggatt, in N.S.W. Gazette.

Coccinella transversalis Fabr. Coccinellidae and *Leis conformis Boisd.* These species have been observed attacking *M. persicae* wherever this aphid is active. Unfortunately, they do not become numerous until late in Spring, by which time much injury may already be caused to peach trees by the aphid. However, they increase rapidly in heavily infested orchards during October and November, and frequently reduce markedly the number of aphids present. They have also been observed preying upon both the over-summering forms and the

autumn forms of the insect. They are predaceous in both the larval and adult stages and they usually consume the whole of a victim's body.

Specimens of *Leis conformis* collected in the Goulburn Valley have proved to be parasitized by an unidentified Braconid wasp. This wasp has been observed to deposit elongate, yellow eggs on the ventral surface of the abdomen of this beetle. The larvae of the wasp are internal parasites and it appears that only one larva develops to maturity in each host beetle. When the parasite larva reaches maturity it leaves the body of its victim, usually through a hole in the dorsal surface of the abdomen, and spins an oval cocoon in which to pupate. The larva is deep yellow in colour and is large when compared with the size of the host.

LITERATURE CITED.

5. WARDLE.—The Problems of Applied Entomology, 1929.

(To be concluded.)

The Tobacco Crop

(*Continued from page* 110).

It will be found that, when picked, the leaf is lacking in that vitality essential to the turning out of a "good cure." This leaf will be difficult to sweat, will show no inclination to change colour in the barn and probably will not improve greatly when bulked after curing.

The greatest caution should be exercised whilst harvesting, so that the accumulation of a large quantity of unsaleable leaf is avoided. In addition to the usual practice of selecting only fully matured leaf, care should be taken not to mix it with leaf from stunted, harsh and brittle plants lacking what can be described only as "handling quality." Unfortunately, there is a big proportion of such leaf present in all crops, and if it be harvested, the market for this grade of leaf will be quickly oversupplied.

Growers would be well advised to give some thought and consideration to the question of handling poor quality leaf before undertaking the expense incurred in harvesting, curing, grading and preparing it for a very doubtful market.

Orchard and Garden Notes

(*Continued from page* 133)

The Vegetable Garden.

Sowings of Onion seed should now be made. There are three types, the white skins, the globe and the brown Spanish, which are harvested in that order. The soil should be deeply worked and well enriched. Seed may be sown in seed-beds, or in the open rows. If sown in seed-beds for later transplanting, the balance of plants remaining in the seed-bed may be left to produce pickling onions. If sown in garden rows, the seed should be thinly sown, for later on, the unnecessary plants must be thinned out. It has been found useful, where small sowings are made, to pour boiling water along the row immediately before sowing. This kills out a proportion of weeds or weed seeds, and gives the germinating onions a better chance.

Tree onions, Shallots and Potato onions may be planted out in rows. These all grow into good-sized bulbs, and they thrive in hot climates where onions are not usually a success.

In harvesting melons and marrows, the vegetables should not be bruised in any way, and a good length of stem should be left on the fruit. If mildew has attacked the foliage, the whole plant should be well dusted with sulphur.

Cabbage and Cauliflower seedlings may be planted out in the beds. Aphis should be kept from them by spraying with nicotine sulphate.

Standard Herd Records

Complete Return of the Cows which completed the Tests during the Quarter ended 31st December, 1933.

In the following is set out the records of all cows which completed a lactation during the quarter. The number is 382, of which 211 qualified for the certificate. The figure in brackets after the owner's name shows the number of entries that qualified for the certificate.

The amount of butter fat required for qualification varies according to the age of the animal (up to 5 years at time of calving) the standards being as follow:—

Junior 2 year old (under 2½ years at time of calving)	230 lb. butter fat.
Senior 2 year old (between 2½ and 3 years at time of calving)	250 lb. butter fat.
Junior 3 year old (between 3 and 3½ years at time of calving)	270 lb. butter fat.
Senior 3 year old (between 3½ and 4 years at time of calving)	290 lb. butter fat.
Junior 4 year old (between 4 and 4½ years at time of calving)	310 lb. butter fat.
Senior 4 year old (between 4½ and 5 years at time of calving)	330 lb. butter fat.
Mature cow 5 years and over	350 lb. butter fat.

(Except where otherwise stated, the period of Test was 273 days.)

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Allan, F. de Vere Allan, Toora, Jersey (1).										
Glen Alice Starleigh ..	C.R.	26.3.33	18½	5,165	5·35	276·40	230	Jr. 2	.. ..	Goldspeck
Alston, N. B., Romsey, Jersey (1).										
Rosyth Jessie's Dream ..	36779	24.2.33	15	5,622	5·04	283·17	250	Sr. 2	232 ..	Lord 2nd of Brucevale
Atherton, W. H., Murraydale, Jersey (1).										
Beverley Empress 3rd ..	32897	11.1.33	20	6,167	5·79	357·25	270	Jr. 3	303 ..	Banyule Remon
Atkinson, W. K., Swan Hill, Dairy Shorthorn (1).										
Willow Park Fairy 3rd ..	Vol. D.S. H.B.	11.1.33	27	9,555	3·97	379·73	350	Mature	246, 291, 277	Havelock of Darbalara
Axford, W. H., Camperdown, Jersey (1).										
Leura Handsome Girl 2nd..	25238	31.3.33	14½	6,321	5·23	330·73	350	Mature	381 ..	Grant of Melrose
Piccaninny of Leura ..	18626	28.3.33	23	7,332	5·57	408·72	350	Mature	408 ..	Quintin of Melksham Park
Ballarat Orphanage, Ballarat, Jersey (2).										
Molly of Tavistock ..	16240	17.1.33	24	8,328	5·37	447·07	350	Mature	383, 375, 467	Molly's Chief of Clover Flat
Wendouree Princess Alyce	Vol. XX.	3.2.33	15½	5,099	5·57	283·83	230	Jr. 2	..	Wompini V.C.
Jerseylea Bright Eyes ..	C.R.	7.2.33	14½	4,097	5·34	218·88	230	Jr. 2	.. ..	Retford Master Noble
Bidgood, F., Staghorn Flat, Jersey (2).										
Staghorn Masters Belle 2nd	28450	21.3.33	25	8,996	6·08	546·92	330	Sr. 4	413, 444 ..	Werribee Northern Masterpiece
Staghorn Masters Belle ..	25762	22.3.33	27½	9,062	6·02	545·59	350	Mature	425, 504, 611	Werribee Northern Masterpiece
Black, Mrs. A. J., Noorat, Jersey (4).										
Noorat Gwen	32091	2.2.33	14½	5,958	5·87	349·56	290	Sr. 3	345 ..	Cellist of Warenda
Noorat Minuet ..	25270	23.2.33	17	6,729	5·55	373·20	330	Sr. 4	295 ..	Cellist of Warenda
Noorat Air Lady ..	36909	27.2.33	16½	5,730	5·69	325·88	230	Jr. 2	..	Air Lord of Banyule
Noorat Gauze ..	32987	23.3.33	17½	5,451	5·60	305·18	290	Sr. 3	259 ..	Cellist of Warenda
Black, I. S., Noorat, Ayrshire (1).										
Ben Kell Bow Bell ..	14081	2.2.33	16½	7,880	3·71	292·74	350	Mature	210, 271, 333, 323, 295	Patronious of Ben Kell
Mount Noorat Alert ..	24144	23.2.33	21½	6,581	4·48	294·74	250	Sr. 2	.. ..	Scottish Major of Gowrie Park
Box, Dr. John, Whittlesea, Jersey (0).										
Melview Frond ..	36938	13.2.33	15½	4,787	5·22	249·66	250	Sr. 2	274 ..	Handsome Boy 12th of Jerseyholme
Broad, A. A., Sutton Grange, Jersey (2).										
Grangelea Rose 2nd ..	C.R.	26.2.33	18	5,111	5·55	283·42	230	Jr. 2	.. ..	Banyule Macon
Grangelea Primrose ..	23007	20.3.33	24	8,066	5·52	445·09	350	Mature	370, 462, 459, 473, 465	Mistletoe's 2nd V.C. of Tarnpirr
Butcher, F. T., Murraydale, Red Poll (1).										
Maryville Ena	3135B	17.2.33	19½	5,972	4·85	289·91	230	Jr. 2	.. ..	Victoria Vice King

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk lb.	Average Test.	Butter Fat lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Chadderton, J. E., Hamilton, Jersey (4).										
Lassie 3rd of Strathbow ..	15464	8.2.33	21	6,560	5·72	375·53	350	Mature	372, 392, 397, 388	Roberts of Melrose
Glen Leigh Dawn ..	33094	7.3.33	22	6,657	5·35	356·27	290	Sr. 3	328 ..	Strathkellar Topthorn
Clover Flat Glossy 2nd ..	28531	20.3.33	26	7,190	5·66	407·15	330	Sr. 4	385, 396 ..	Beau Brummell of Banyule
Glen Leigh Dora ..	25789	19.3.33	30½	8,510	5·82	495·01	350	Mature	382, 495, 491	Gadabout of Danton
Chester, E. N., Mt. Scobie, Jersey (1).										
Radford Lady Golden ..	33117	3.2.33	18½	4,264	5·87	250·45	250	Sr. 2	275 ..	Ballara Golden Lad
Ballara Lady	23022	6.3.33	22	6,275	5.32	334·00	350	Mature	352, 360 ..	Werribee Madeira's Cream Masterpiece
Chirnside, R. M., Whittlesea, Jersey (5).										
Mornmoot Princess Madeira	37071	11.1.33	20	7,391	5·73	423·52	230	Jr. 2	.. ..	Werribee Grandmaster
Werribee Princess Satisfaction	28543	16.1.33	31	10,100	5·81	586·81	310	Jr. 4	595 ..	Werribee Butter King
Brucevale Fancy Madeira 2nd	25801	21.1.33	27½	7,172	6·29	451·44	350	Mature	358, 424, 514	Masterpiece of Brucevale
Mornmoot Modiste 2nd ..	33140	3.2.33	18½	6,224	6·60	411·06	250	Sr. 2	360 ..	Werribee Prince Madeira
Clarendon Eyre Pinafore 2nd	38553	14.2.33	17½	6,650	5·13	341·34	330	Sr. 4	291 ..	Sir Northwood
Chitty, C., Kongwak, Jersey (0).										
Aveley Norma 4th ..	33146	15.2.33	18	5,190	5·17	268·56	310	Jr. 4	329, 409 ..	Marc Anthony of Aveley
Clark P. W., Whittlesea, Jersey (1).										
Clovelly Sweet Briar ..	33166	25.3.33	N.O.C.	6,555	5·56	364·66	350	Mature	349, 329 ..	Gay Gordon of Clovelly
Clyne, Executors late J., Upper Maffra West, Jersey (11).										
Jersey Vale Marigold ..	25317	15.1.33	25½	8,222	4·87	400·37	350	Mature	276, 405, 400	Princess 2nd Twylish of Grangelea
Beauty 4th of St. Albans..	15440	24.1.33	28	9,777	5·84	570·76	350	Mature	485, 598, 548, 592, 564	King 3rd of St Albans
Ipomea 2nd of Swansea ..	21191	25.1.33	21	6,839	4·88	333·44	350	Mature	307, 427, 491, 415	Prince of Belgonia
Paisley Coralie ..	33175	6.2.33	23	7,809	5·32	415·43	310	Jr. 4	319, 415 ..	Werribee Masterkey
Paisley Molly Bawn ..	Vol. 20	10.2.33	18	6,282	4·88	306·53	230	Jr. 2	.. ..	Paisley Master Boy
Paisley Prim ..	37110	12.2.33	18	6,089	5·39	328·49	290	Sr. 3	331 ..	Prince of Swansea
Cora of Paisley ..	17720	13.2.33	20½	7,089	5·23	370·60	350	Mature	302, 401, 368, 412, 408	Double Twylish of Elouera
Paisley Dolichos ..	37106	14.2.33	18	6,767	5·67	383·79	270	Jr. 3	344 ..	Werribee Masterkey
Flossie of Swansea ..	21189	28.2.33	18	7,025	5·57	391.54	350	Mature	200, 312, 362, 314, 398	Bonnie Boy of Swansea
Paisley Fancy	Vol. 20	11.3.33	13½	4559	5·60	255·34	230	Jr. 2	.. ..	Werribee Masterkey
Paisley Princess ..	37111	14.3.33	18	7,325	4·98	364·97	290	Sr. 3	306 ..	Prince of Swansea
Paisley Shirley ..	37113	25.3.33	17	6,410	5·61	359·55	290	Sr. 3	309 ..	Werribee Masterkey
Cockbill Bros., Bacchus Marsh, Ayrshire (5).										
*Fulham Virtue ..	13340	2.1.33	4	8,535	3·93	335·58	350	Mature	323, 342, 360, 424	His Majesty of Wethersdane
Fulham Flora	20021	6.1.33	20½	7,865	5·22	410·73	310	Jr. 4	290, 354 ..	Fulham Future
Fulham Violet	17941	22.1.33	18½	8,598	4·29	369·13	350	Mature	243, 330, 406	The Laird of Sparrovale
Fulham V. ..	23751	1.2.33	30	7,992	4·16	332·22	230	Jr. 2	.. ..	Glengowrie Poitrel
Fulham Verbena ..	23752	17.2.33	20½	7,725	4·19	324·02	230	Jr. 2	.. ..	Olivedale Comet
Fulham Vision ..	14650	17.2.33	21½	4,731	4·40	208·32	350	Mature	322, 296, 347, 303	Fulham Future
Cora of Burnside ..	8894	18.3.33	18½	7,995	4·64	370·57	350	Mature	182, 125, 347, 373, 359, 468, 332, 443, 426	Gregor of Oakbank
Cockbill Bros., Rockbank, Ayrshire (0).										
Fulham Vogue ..	22754	3.2.33	16	5,708	4·63	264·52	310	Jr. 4	231, 233 ..	Fulham Future
Fulham Dainty ..	23744	3.2.33	12½	4,562	4·70	214·25	230	Jr. 2	.. ..	Fulham Future
Fulham Gracious ..	21429	19.2.33	10	4,850	4·43	214·64	270	Jr. 3	125 ..	Fulham Victory
Fulham Vie	22752	21.2.33	8	3,567	4·51	160·88	230	Jr. 2	.. ..	The Laird of Sparrovale
Fulham Beautiful ..	22744	22.2.33	13	4,269	3·98	169·88	230	Jr. 2	.. ..	Olivedale Comet
Fulham Alice ..	21424	28.2.33	10	5,604	4·19	235·01	290	Sr. 3	259 ..	The Laird of Sparrovale
Fulham Frivol	C.R.	10.3.33	8½	3,027	4·72	142·74	230	Jr. 2	.. ..	The Laird of Sparrovale
Fulham Bessie ..	21425	13.3.33	7	4,226	4·39	185·57	270	Jr. 3	133 ..	The Laird of Sparrovale
Fulham Modest ..	20026	16.3.33	16	5,102	4·47	227·87	310	Jr. 4	246, 281 ..	Fulham Future
Cockbill Bros., Tongala, Ayrshire (0).										
Fulham Beatrice ..	17932	30.1.33	9	5,565	3·57	198·52	350	Mature	214, 256 ..	The Laird of Sparrovale
Fulham Lucy ..	13335	25.2.33	N.O.C.	5,709	4·16	237·65	350	Mature	273, 255, 190, 190, 228, 197, 199	His Majesty of Wethersdane
Fulham Lyric ..	20024	16.3.33	N.O.C.	5,034	4·06	204·36	310	Jr. 4	193, 255 ..	The Laird of Sparrovale

* 240 days in test.

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Colenso, L. W., Alvie, Jersey (4).										
Normandie Primrose 2nd ..	C.R.	1.3.33	12	4,438	5·78	256·66	230	Jr. 2	.. ..	Normandie White Peer
Nancy 4th of Somerset ..	17401	7.3.33	22	7,361	5·35	393·55	350	Mature	304, 442 ..	Sergeant B of Somerset
Hawthorn of Belmont ..	18666	9.3.33	21½	6,894	5·39	371·25	350	Mature	435, 464, 539	Vanillas Hero of Tavistock
Normandie Hawthorn 2nd	33191	16.3.33	23½	7,364	5·25	386·69	250	Sr. 2	.. ..	Peer of Lewisham
Normandie Thelma ..	24304	19.3.33	14	5,594	5·11	285·84	350	Mature	275, 356, 332, 368	Thelma's King of St. Albans
Coughlin, C., Yannathan, Jersey (1).										
Aveley Valda's Petal ..	26314	16.2.33	28	7,049	5·37	378·36	350	Mature	188, 258, 254, 377	Economist of Aveley
Cox, A., Mt. Scobie, Jersey (2).										
Tavistock Stumpy 3rd ..	29119	28.12.32	13	6,041	5·68	343·13	350	Mature	294, 317, 358	Aerial of Banyule
Tavistock Hope ..	37149	5.2.33	25	6,527	5·57	363·39	270	Jr. 3	318 ..	Moorella Ranger
Tavistock Patty ..	25819	21.2.33	9	5,638	5·53	311·58	350	Mature	299, 322, 428	Audrey's Prince of Banyule
Tavistock Faith ..	28606	22.2.33	26½	7,991	5·01	400·74	350	Mature	260, 334, 340	Audrey's Prince of Banyule
Audrey's Pearl of Tavistock	18673	25.2.33	13	5,607	5·43	304·49	350	Mature	463, 424, 411	Audrey's Prince of Banyule
Tavistock Patricia ..	23053	25.3.33	23	5,914	5·70	337·28	350	Mature	404, 425, 457	Audrey's Prince of Banyule
Crawford, Mrs. E., Yinnar, Jersey (0).										
Vanilla of Mendip ..	18993	28.3.33	13	4,817	5·66	272·47	350	Mature	264, 300, 284	Jessie 13th Count of Melrose
Davies, J. W., Coalville, Jersey (0).										
Clydevale Petal's Beauty	33268	9.1.33	7	2,838	4·95	140·50	270	Jr. 3	231 ..	Staghorn Master's Defiance
Clydevale Morning Star ..	37210	30.1.33	11	3,170	5·47	173·48	250	Sr. 2	188 ..	Staghorn Master's Defiance
Day, E., Penshurst, Jersey (1).										
Viewpoint Beauty ..	33262	18.3.33	19½	5,672	5·78	327·66	250	Sr. 2	.. ..	Viewpoint Noble
De la Rue, N. C., Weering, Jersey (1).										
Lucerne Vale Masters Carnation	C.R.	10.1.33	20	5,534	5·20	287·79	230	Jr. 2	.. ..	Werribee Fancy Masterpiece
Department of Agriculture, Burnley, Jersey (0). ..										
Victoria Enchantress ..	37216	17.2.33	12	3,935	5·82	229·04	230	Jr. 2	.. ..	Victoria Master Mariner
Department of Agriculture, Werribee, Friesian (1).										
Victoria Tinkle Belle ..	3266	29.3.33	23	11,988	3·39	406·24	350	Mature	261, 417 ..	Dominion Oakdale
Department of Agriculture, Werribee, Red Poll (7).										
Victoria Velbit ..	2341A	2.1.33	20½	8,462	4·04	341·61	350	Mature	328, 328, 303	Victoria Bit-o-bacca
Victoria Coquette ..	3015A	19.1.33	22	7,709	4·04	311·36	270	Jr. 3	306 ..	Vice Regal
Victoria Bellalae ..	2304A	20.1.33	21	8,004	4·40	352·23	330	Sr. 4	252, 284 ..	Vice Regal
Victoria Gratification ..	3022A	22.1.33	21	6,470	5·10	329·83	230	Jr. 2	.. ..	Victoria Satisfaction
Victoria Peace ..	2327A	28.1.33	23	6,957	4·79	333·44	350	Mature	309, 335, 325	Victoria Bit-o-bacca
Victoria Zephyr ..	3043A	7.2.33	14	6,206	4·27	264·98	230	Jr. 2	.. ..	Vice Regal
Victoria Repose ..	3033A	10.2.33	15½	5,075	4·50	228·41	230	Jr. 2	.. ..	Dom Bright Belgian
Victoria Vice Royal ..	2762AA	13.2.33	13	4,181	4·57	191·26	230	Jr. 2	.. ..	Vice Regal
Victoria Bright Blue ..	3011A	13.2.33	16½	5,456	4·54	247·78	230	Jr. 2	.. ..	Dom Bright Belgian
Victoria Ghazal ..	2320A	20.2.33	25	8,483	4·34	368·51	330	Sr. 4	253, 353 ..	Vice Regal
Victoria Algiers ..	3004A	1.3.33	13	6,141	4·28	262·98	270	Jr. 3	248 ..	Victoria Royal Ringer
Victoria Eagle ..	2315A	4.3.33	18½	7,164	5·35	383·38	350	Mature	298, 340 ..	Vice Regal
Desmond, J. J., Rochester, Jersey (2).										
Macroom Lady Bird ..	C.R.	11.1.33	12	4,743	6·63	314·59	250	Sr. 2	.. ..	Belgonia Battery
Macroom Princess ..	40856	8.3.33	12½	6,760	4·28	289·28	270	Jr. 3	293 ..	Belgonia Battery
Dick, J., Tyntynder South, Ayrshire (1).										
Grand View Melba 2nd ..	21704	24.2.33	19	8,844	3·85	340·45	310	Jr. 4	215 ..	Grand View Blazer
Dickenson Bros. Sebastopol, Friesian (0).										
Ashby Queenberry ..	3316	28.1.33	26	6,297	3·57	224·61	270	Jr. 3	268 ..	Bolobek]Dominic
Downie Bros., Longwarry South, Ayrshire (0).										
Glen View Kathie 2nd ..	23894	3.2.33	15	5,763	4·05	233·29	270	Jr. 3	.. ..	Gowrie Park Dairy Boy
Glen View Marie 3rd ..	C.R.	3.3.33	7½	3,849	3·77	145·05	290	Sr. 3	.. ..	Gowrie Park Dairy Boy
Ducat and Sons, P. J., Ardmona, Jersey (2).										
Airlie Buttercup 9th ..	C.R.	1.1.33	14	4,358	6·18	269·28	230	Jr. 2	.. ..	Airlie Starlight
Airlie Beatrice 3rd ..	38465	27.1.33	19½	6,341	6·81	431·97	270	Jr. 3	312 ..	Hedge of Banyule
Airlie Beauty 6th ..	C.R.	10.3.33	11	3,348	5·96	199·62	250	Jr. 2	.. ..	Airlie Goldfinder

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.		Sire.
Earle, S. N., Clyde, Jersey (3).											
Benguella Kenta ..	37306	15.1.33	4	3,225	4·80	154·76	270	Jr. 3	..	..	Flowers King of Benguella
Benguella Princess Viola 3rd ..	C.R.	29.1.33	11	3,419	5·59	190·98	250	Sr. 2	..	..	Benguella Sunrise
Benguella Rita	C.R.	1.2.33	16	5,798	4·71	273·04	230	Jr. 2	..	..	Benguella Sunrise
Benguella Retakin ..	37309	6.2.33	13½	3,515	6·07	213·19	230	Jr. 2	..	..	Benguella Sunrise
Goldfield Rita	25860	8.3.33	24	7,140	5·00	357·11	350	Mature	417, 359	..	Assayer of Banyule
Benguella Lady Bountiful	37307	27.3.33	15	4,720	5·75	271·57	250	Sr. 2	..	..	Benguella Sunrise
Emmett, W. H., Stanhope, Jersey (0).											
Banyule Silvermine 62nd ..	28843	11.2.33	N.O.C.	5,751	4·94	283·95	290	Sr. 3	355	..	Air Lord of Banyule
Enders, N. H., Stanhope, Jersey (3).											
The Wattles Valencia ..	33992	16.1.33	22	7,007	5·97	418·12	290	Sr. 3	382	..	Choice Prince of Belgonia
The Wattles Bluebell 2nd	37342	4.2.33	21	6,848	5·11	349·83	230	Jr. 2	..	..	Prince of the Wattles
Jubilee Witch Hazel ..	18940	17.3.33	27½	9,330	5·66	527·74	350	Mature	524, 512	..	Goddington Winks 6th (Imp.)
Evans A., Heywood, Jersey (1).											
Boronia Farm Linnet ..	33329	9.2.33	20½	5,181	6·19	320·75	270	Jr. 3	250	..	Prince of Boronia Farm
Boronia Farm May ..	23129	28.3.33	N.O.C.	6,804	4·90	333·53	350	Mature	236, 181, 300, 327		Frost of Castlemaddie
Fairchild and Clutterbuck, Tinamba, Jersey (0).											
Vaucluse Blossom ..	33334	3.2.33	N.O.C.	3,740	6·30	235·48	290	Sr. 3	244, 309	..	Handsome Boy 9th of Jerseyholm
Findlay, G., Leitchville, Jersey (1).											
Leven Brae Lal Grey ..	23135	8.1.33	10	7,539	5·13	386·47	350	Mature	307, 320, 352, 463, 372		Twylish Fox of Colac
Findlay, T. R., Leitchville, Jersey (2).											
Leven Brae Gay Rose ..	37377	26.1.33	14	8,538	5·54	472·90	330	Sr. 4	317, 391	..	Werribee Gaypiece
Leven Brae Gay Duchess ..	37376	27.1.33	13½	8,940	5·09	455·16	270	Jr. 3	398	..	Werribee Gaypiece
Fisken, A., Yendon, Dairy Shorthorn (0).											
Poplar Vale Princess 194 ..	Vol. 1	10.1.33	23	7,089	3·66	259·46	350	Mature	200, 262, 264,		Poplar Vale Prince 130th
Fixter, A., Boisdale, Guernsey (0).											
Mincha Vale Daphne ..	2682	29.12.32	18	5,952	5·72	340·42	350	Mature	346, 371, 379, 365		Golden Chief of Melbourne
Fernlea Daphne	2680	5.2.33	18½	5,681	5·99	340·31	350	Mature	296, 339, 399		Werribee Jessie Boy
Fernlea Eve	2539	7.2.33	12	4,898	5·61	274·78	310	Jr. 4	276, 307	..	Yarraview Albert
Fixter, Wm., Boisdale, Jersey (0).											
Olivedale Jewel 2nd ..	C.R.	23.2.33	9	3,547	5·16	183·10	230	Jr. 2	..	..	Olivedale Masterpiece
Foster Bros., Boisdale, Jersey (8).											
Boisdale Heather ..	33346	17.1.33	11½	4,909	6·60	324·09	290	Sr. 3	212, 216	..	Valiant Prince of Glen Iris
Night Shade 2nd of Springhurst	14255	25.1.33	19½	6,185	6·66	411·88	350	Mature	333, 394, 417, 470, 308, 538, 358		Arcadia's Choice of Tarnpirr
Boisdale Sparkle ..	28702	3.2.33	15½	5,459	6·73	367·20	310	Jr. 4	304	..	Lord Island's Fancy of Brucevale
Strathbow Audrey ..	34279	4.2.33	23	7,013	5·63	394·58	270	Jr. 3	301	..	Ballara His Majesty
Hazeldale Bangle ..	37386	13.2.33	9½	5,420	5·36	290·61	270	Jr. 3	233	..	Dinkum of Banyule
Brunette 22nd of King's Vale ..	21084	2.3 33	23½	7,728	5·19	401·25	350	Mature	309, 407, 422, 356, 392		Ruby's Lad of King's Vale
Ballara Madeira ..	23145	9.3.33	20	7,728	5·73	443·17	350	Mature	302, 309, 359, 373		Werribee Madeira Cream's Masterpiece
Boisdale Netta 2nd ..	C.R.	14.3.33	11½	3,899	5·91	230·28	230	Jr. 2	..	..	Gladiator of Springhurst
Boisdale Heath ..	C.R.	28.3.33	6½	4,506	5·10	229·91	250	Sr. 2	..	..	Boisdale Emperor
Fraser, G. A., Addington, Ayrshire (1).											
Glengowrie Elma ..	23872	5.1.33	9½	5,586	4·44	247·94	270	Jr. 3	243	..	Glengowrie Baronet
Bonnie Doon Daphne ..	C.R.	17.2.33	23½	6,753	4·58	309·59	230	Jr. 2	..	..	Bonnie Doon Dudley
Glengowrie Mermaid ..	24999	5.3.33	14½	6,254	3·55	221·94	350	Mature	..	..	Strathavon Sweet Boy
Freestone, P. A., Murchison, Jersey (2).											
Melba of Jersey Vale ..	21542	21.1.33	21	7,050	6·08	428·67	350	Mature	170, 426, 422		Choice 2nd of Tarnpirr
Belzonya Romany's Pride ..	37391	21.1.33	19	5,139	6·63	340·64	270	Jr. 3	259	..	Belgonia Stumpy's Twylish
Jerseyvale Princess 3rd ..	29281	16.2.33	28	7,383	5·33	293·87	330	Sr. 4	249, 254, 394		Princess 2nd Twylish of Grangelea
Gange, Mrs. E. M., Werribee South, Ayrshire (1).											
Roseleigh Azelia ..	16575	4.1.33	..	9,719	4·48	435·48	350	Mature	253, 420	..	Oakbank Reply
Gay, R. G., North Devon, Jersey (2).											
Elm Grove Jessie Fowler 2nd	37415	26.2.33	21	6,544	5·23	342·08	250	Sr. 2	348	..	Gold Star of Melrose
Buttercup of Elm Grove ..	21303	24.3.33	22	8,642	4·96	428·65	350	Mature	450, 420, 500, 553		Gold Star of Melrose
Gorman, A. W., Alexandra, Ayrshire (1).											
Cathcart Merline ..	21141	10.3.33	20	6,975	4·31	300·56	270	Jr. 3	354	..	Ben Kell Watford

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Gregg, V., Whittlesea, Jersey (2).										
Stoneycroft Plum ..	37438	14.1.33	17	5,031	6·35	319·35	250	Sr. 2	283 ..	Kantara Don Juan
Stoneycroft Roma ..	Vol. 20	15.1.33	22	5,495	6·31	346·90	230	Jr. 2	.. ..	Kantara Don Juan
Handbury, J. E. and Son, Toora, Jersey (2).										
Tooravale Lassie 4th ..	28730	27.1.33	15	4,502	6·35	285·81	330	Sr. 4	275 ..	Welkin of Melrose
Tooravale Lassie Fowler 6th	34051	25.2.33	19	5,299	5·92	313·90	290	Sr. 3	269 ..	Tooravale Goldspeck
Tooravale Lassie 3rd ..	15905	27.3.33	17	7,714	6·25	481·99	350	Mature	243, 331, 488	Welkin of Melrose
Handley, G. C., Dandenong, Jersey (1).										
Marimba Briar Rose 3rd	29567	27.2.33	24½	8,189	4·99	408·60	350	Mature	259, 417, 462	Marimba Lily's Chief 2nd
Harrison and Sons, Moondarra, Jersey (0).										
Mornmoot Meloa 2nd ..	33133	19.2.33	14½	4,955	5·30	262·53	270	Jr. 3	344 ..	Choirmaster of Banyule
Mornmoot Maple ..	28533	26.3.33	17	4,839	5·72	276·69	310	Jr. 4	331 ..	Austral Valley Gay Spark
Harvey, T., Boisdale, Jersey (1).										
Jerseyholm Empress 25 ..	37509	2.3.33	16	5,162	5·37	277·01	230	Jr. 2	.. ..	Werribee Masters Fox
Hastings, R. P., New Gisbourne, Jersey (1).										
Elderslie Lady Aster ..	37514	15.2.33	18	4,812	5·82	280·09	230	Jr. 2	.. ..	Concentration of Banyule
Henderson, R. and Sons, Macorna, Ayrshire (0).										
Ripon Lea Blossom ..	18878	1.1.33	8	5,607	4·88	273·71	330	Sr. 4	.. ..	Cathcart Mentor
*Cathcart Betty ..	13579	2.2.33	4	5,700	4·30	244·95	350	Mature	268 ..	Poppy's Advance of Ben Kell
Holbing, L. W. C., Tongala, Jersey (1).										
Eildon Island Daisy ..	C.R.	11.3.33	14	4,002	5·90	236·03	230	Jr. 2	.. ..	Brucevale Lord Island
Hore, A. J., Horefield, Illawarra Shorthorn (1).										
Alne Bank Primrose 10th	Vol. 4	28.2.33	N.O.C.	4,487	3·95	177·10	230	Jr. 2	.. ..	Spearfelt of Alne Bank
Tabbagong Virgin 2nd ..	Vol. 4	1.3.33	N.O.C.	7,112	4·06	289·10	230	Jr. 2	.. ..	Tabbagong Warrior
*Rosemont Handsome 4th	Vol. 4	7.3.33	4	5,775	3·31	190·95	230	Jr. 2	.. ..	Merry Count of Berry
Tabbagong Gentle 3rd ..	Vol. 4	13.3.33	20	6,152	3·72	228·68	230	Jr. 2	.. ..	Regent of Tabbagong
Hore, L. G., Horefield, Illawarra Shorthorn (1).										
Alne Bank Beauty 10th ..	Vol. 4	23.1.33	21	6,701	3·59	240·84	230	Jr. 2	.. ..	Lemon Grove Rufus
*Kimo Melba 3rd ..	2790	11.2.33	4	6,540	4·60	300·93	310	Jr. 4	321 ..	Doncaster of Darbalara
*Horfield Daisy 2nd ..	Vol. 4	15.2.33	4	5,985	3·53	211·29	230	Jr. 2	.. ..	Colmar of Aralabrad
Glengowrie Dora ..	Vol. 4	27.3.33	18	6,473	3·12	202·02	230	Jr. 2	.. ..	Greyleigh Bradman
Hore, M. T., Horefield, Friesian (2).										
Bolero Rosebelle ..	3358	11.1.33	32	11,984	4·04	484·59	270	Jr. 3	.. ..	Burnbank Inka Sylvia's Lad
Elmar Ideal Patch ..	Vol. 12	24.2.33	22½	10,574	3·03	320·44	230	Jr. 2	.. ..	Greenvale Oakwood Posch
Huffer, J. A., Gormandale, Jersey (1).										
Glen Valley Quick Sand ..	23218	16.3.33	17	6,440	5·49	353·53	350	Mature	331, 471, 460, 475	Waverley's Count of Glen Valley
Hurley, P. and Sons, Murraydale, Jersey (1).										
Hazelgrange Kitty 2nd ..	33889	1.1.33	N.O.C.	6,744	5·48	369·49	270	Jr. 3	.. ..	Master Clement of Glen Iris
Hurrey, W. H., Koonwarry, Jersey (0).										
Kooreena Carrie ..	25949	5.1.33	12½	4,528	6·48	293·37	350	Mature	256, 358, 286	Pearl's Butter King of Kirkhill
Hutchinson and Son, Somerville, Jersey (5).										
St. John's Curio 6th ..	23011	22.1.33	21½	6,318	6·71	424·08	350	Mature	485 ..	Valda's Lad of Comely Banks
Somerville Duchess 2nd ..	C.R.	15.2.33	15½	4,262	4·70	200·39	230	Jr. 2	.. ..	Somerville Reputation
Somerville Babs 6th ..	C.R.	18.2.33	29	7,776	4·85	377·47	230	Jr. 2	.. ..	Banyule Aeronaut
Wynette of Somerville ..	18759	25.2.33	38	10,902	5·69	620·70	350	Mature	403, 566, 552, 519, 564	Heroic of Somerville
Somerville Princess Betty	C.R.	3.3.33	19½	5,727	4·56	261·09	230	Jr. 2	.. ..	Somerville Reputation
Somerville Sunrose ..	37626	21.3.33	25	7,110	5·61	399·05	250	Sr. 2	339 ..	Somerville Reputation
Ingram, A. B., Millgrove, Illawarra Shorthorn (0).										
*Alne Bank Speck ..	5051	11.1.33	4	4,305	3·57	153·54	230	Jr. 2	.. ..	Alne Bank Magic
Alne Bank Clarice ..	5049	16.1.33	11½	3,798	3·88	147·34	230	Jr. 2	.. ..	Greyleigh Archer
Kinlossie Barbara ..	5053	29.1.33	5½	3,959	4·28	169·56	250	Sr. 2	.. ..	General of Glenburn
The Pines Polly 2nd ..	Vol. 3	29.1.33	22	5,886	3·62	213·23	310	Jr. 4	245 ..	Hero of Lemon Grove
Alne Bank Rosalie ..	5050	31.1.33	25½	4,505	3·86	173·73	230	Jr. 2	.. ..	Dan of Greyleigh
Itzerott Bros., Heathcote, Jersey (3).										
Five Gum's Goldie 3rd ..	34114	5.1.33	24	7,004	5·28	369·50	290	Sr. 3	451 ..	Pearl's Lad of Coolwoola
Five Gum's Primula 5th ..	34116	22.2.33	21½	7,553	5·59	422·15	290	Sr. 3	343 ..	Pearl's Lad of Coolwoola
Primula of Five Gums ..	19918	16.3.33	19	7,602	6·08	462·32	350	Mature	395 ..	Lassie Fowler 5th's Son of Melrose

* 240 days in test.

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
King, H. W., Warragul, Jersey (2).										
Karoola Honeybee ..	21389	30.1.33	23½	7,826	4·74	371·18	350	Mature	412, 426, 533, 512, 492	Gordon of Oaklands
Karoola Sweet Nell ..	33441	22.2.33	24½	6,058	5·07	307·23	270	Jr. 3	289, 378 ..	Cream Lad of Mayland
Knowles, T., Dandenong, Ayrshire (3).										
Dandy Limelight ..	23609	2.1.33	17	7,622	4·46	339·67	270	Jr. 3	284 ..	Beleura Sarchedon
Dandy Olive	23613	1.2.33	22½	8,477	3·95	334·88	270	Jr. 3	295 ..	Beleura Sarchedon
Dandy Lily	23608	29.3.33	19	9,837	4·16	408·76	270	Jr. 3	319 ..	Beleura Sarchedon
Koenig Bros., Mooroopna, Ayrshire (3).										
Boringa Linda	C.R.	14.1.33	20½	7,821	4·05	316·88	230	Jr. 2	.. ..	Boringa Laddie
Scotswood Joybell ..	18918	21.1.33	28½	10,631	4·64	493·09	350	Mature	288, 330, 294	Federal of Warrook
Wattle Park Elaine ..	19214	7.3.33	19½	8,801	3·74	329·15	350	Mature	292, 333 ..	Osborne Park Majestic
Scotswood Dolly Brown ..	22068	19.3.33	24½	9,974	4·32	431·15	310	Jr. 4	218 ..	Scotswood Prime Minister
Lade, A., Alexandra, Jersey (0).										
Hythe Begonia ..	40273	4.2.33	12	3,566	5·12	182·42	250	Sr. 2	.. ..	Alert of Farringdon
Jess's Fancy of Glen Vale ..	21422	26.3.33	17	5,328	4·89	260·60	350	Mature	309, 386, 393	King of St. Albans
Lennie, Mrs. E. M., Tongala, Jersey (0).										
The Valley Madam ..	34162	29.1.33	12½	4,221	4·98	210·08	230	Jr. 2	.. ..	Dollar of The Valley
Le Noury, E., Werribee, Guernsey (2).										
Werribee Merry Maid ..	2638	26.2.33	11½	4,992	6·22	310·42	270	Jr. 4	214 ..	Yarraview Saxon
Melbourne Matron ..	3695	24.3.33	18	4,857	5·67	275·27	250	Sr. 2	.. ..	Melbourne Don 7th
Lindsay, G., Pakenham, Jersey (1).										
Unandera Carmen 3rd ..	C.R.	24.2.33	14½	4,620	5·16	238·62	230	Jr. 2	.. ..	Meridale Bright Light
Alister Myrtle	26228	26.2.33	16½	5,636	4·80	270·57	350	Mature	.. ..	Starbright Duke of Glen Iris
Longerenong Agricultural College, Dooen, Ayrshire (1).										
Longerenong Acacia Baileyana	Vol. 26	12.3.33	18½	6,569	4·98	326·85	250	Sr. 2	.. ..	Longerenong Baron
Lyon, C. G., Heidelberg, Jersey (4).										
Banyule Tiddlewinks 9th	34198	18.1.33	20½	5,927	5·29	313·53	230	Jr. 2	.. ..	Concentration of Banyule
Banyule Silvermine 63rd	28844	2.2.33	23	6,101	5·39	329·04	270	Jr. 3	343 ..	Air Lord of Banyule
Banyule Molly 25th ..	24458	5.3.33	22	6,671	5·32	354·79	350	Mature	375, 443, 406	Wotton Airman
Banyule Silvermine 49th ..	24469	17.3.33	25½	7,862	5·13	403·16	350	Mature	282, 418, 457	Concentration of Banyule
Lyon, W. H., Sale, Jersey (0).										
Studleigh Duchess 10th ..	37008	28.1.33	4	3,323	6·81	226·21	250	Sr. 2	292 ..	Studleigh Masterpiece
Avon Blanchette 10th ..	Vol. 20	2.2.33	N.o.c.	3,972	5·74	228·13	230	Jr. 2	.. ..	Jessie 13th's Count of Melrose
Avon Daphne 3rd	34200	12.2.33	18	5,970	5·44	324·88	350	Mature	.. ..	Jessie 13th's Count of Melrose
Studleigh Fancy Starbright	37009	16.2.33	11½	4,312	5·49	236·66	290	Sr. 3	287 ..	Studleigh Masterpiece
Avon Daphne	38730	19.3.33	12	5,903	4·95	292·39	350	Mature	.. ..	Jessie 13th's Count of Melrose
Macauley, C. W., Rochester, Jersey (1).										
Taranah Radiance ..	37858	18.1.33	17½	5,603	5·42	303·59	250	Sr. 2	.. ..	Duke of Invermay
McClelland, Miss C. E., Tunstall, Jersey (2).										
Poppy of The Elms ..	21447	18.2.33	31½	8,834	4·77	421·75	350	Mature	266, 380, 355, 439	Relbia's Nap of Austral Park
The Elms Pansy ..	42148	24.2.33	24	6,710	4·68	314·25	290	Sr. 3	.. ..	Lord Starbright of Brucevale
McCosh, S. J., Wandin, Jersey (0).										
*Goronga Farm Daffoplane ..	38094	27.1.33	4	3,330	5·78	192·36	270	Jr. 2	240 ..	Banyule Triplane
McErvale, J. and Sons, Camperdown, Jersey (0).										
Cumnock Fancy Alice ..	C.R.	10.3.33	15	4,562	6·13	279·79	290	Sr. 3	.. ..	Cumnock Fancy Masterpiece
McInnes, A. A., Gunbower, Dairy Shorthorn (0).										
Loch Ness Pearl Beauty 2nd	Vol. 1	6.3.33	7	6,618	3·97	262·46	290	Sr. 3	243 ..	Brayland Matilda's Duke
McNabb, and Son Irrewillipe East, Jersey (8).										
Maxon Noble's Queen ..	29079	25.1.33	25	7,605	5·48	416·51	330	Sr. 4	252, 269 ..	Noble of Avalon
Easter Daisy of Springhurst	21607	22.2.33	22	8,312	4·81	399·41	350	Mature	293, 360, 413, 388, 431	Alloy of Banyule
Boorene Silvermine's Clara ..	25250	26.2.33	22	6,506	5·39	350·45	350	Mature	364, 354, 429, 397	Lady Grey's Silvermine 2nd of Somerset
Cora of Linga Longa ..	15430	27.2.33	22	7,359	5·44	400·31	350	Mature	339, 367, 456, 491, 531, 539, 509, 439	Dawn of Warenda
Maxon Lodie	34219	9.3.33	15	4,451	6·35	282·69	270	Jr. 3	274 ..	Maxon Starbright's Prince 4th
Maxon Lodestone ..	29076	25.3.33	14½	5,765	6·52	375·77	330	Sr. 4	255, 255, 413	Starbright's Prince of Glen Iris
Maxon Alsyke	34216	25.3.33	17½	5,783	5·60	324·11	310	Jr. 4	267, 391 ..	Mercedes Chief 7th of Avalon
Maxon Sweet Marie ..	29080	26.3.33	23½	7,407	5·28	391·05	330	Sr. 4	282, 361, 479	Lady Grey's Silvermine 2nd of Somerset
Maher, R. H., Tongale, Jersey (0).										
Rosemont Lassie Fowler 4th	37877	7.3.33	9½	4,341	5·35	232·14	350	Mature	280 ..	Rosella's 2nd Noble of Rosemont

* 210 days in test.

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Mesley, T., Dalyston, Jersey (2).										
*Warenda Mandoline 4th	33521	27.1.33	N.O.C.	6,915	5·43	375·18	310	Jr. 4	368, 408 ..	Warenda Snap
Warenda Gazelle 7th ..	29150	29.3.33	23	6,690	5·90	394·89	350	Mature	401, 423, 490	Warenda Snap
Middleton, E. M., Hamilton, Jersey (4).										
Castlemaddie Velveteen ..	29159	29.12.32	16½	4,785	5·85	279·78	350	Mature	389, 310, 533	Wotton Airman
Wompini Leonie 8th ..	37929	2.1.33	9½	3,498	6·64	232·11	270	Jr. 3	360 ..	Brucevale Brightstar
Wompini Shasta Daisy ..	37930	7.1.33	15	5,063	6·25	316·55	270	Jr. 3	320 ..	Werribee Masterman
Kyora Dream Girl ..	29160	29.1.33	26½	7,618	6·02	458·60	350	Mature	374, 416, 467	Perree's Duke (Imp.)
Nairana Corolla 2nd ..	29229	3.2.33	26	7,325	5·59	409·41	290	Sr. 3	306 ..	Goldstar of Strathbow
Melrose Blossom 11th ..	33962	12.2.33	18½	5,612	5·57	312·68	310	Jr. 4	299, 313 ..	Masterpiece
Kyora Miama's Anthem ..	26442	6.3.33	..	6,011	5·77	346·65	350	Mature	305 ..	Miama's Volunteer of Woodside
Moore, J. and Co., Yarram, Jersey (1).										
*Tooloonook Sainfoin ..	33546	11.1.33	4	4,785	5·04	241·32	350	Mature	296 ..	Dauntless of Somerville
Tooloonook Plumbago 3rd	42248	21.1.33	10½	3,767	5·57	209·90	310	Jr. 4	310, 364 ..	Beauty 4th's Command of Somerville
Tooloonook Verbena 4th ..	C.R.	9.2.33	14	4,021	4·82	193·82	230	Jr. 2	.. ..	Heroic of Somerville
Tooloonook Antimony's Bessie 3rd	42245	3.3.33	N.O.C.	4,235	5·83	246·82	310	Jr. 4	245, 373 ..	Beauty 4th's Command of Somerville
Tooloonook Boltonia 2nd ..	33541	15.3.33	11	5,070	5·34	270·64	330	Sr. 4	259, 336 ..	Heroic of Somerville
Tooloonook Peach 2nd ..	37958	27.3.33	N.O.C.	7,386	4·66	344·04	290	Sr. 3	298 ..	Heroic of Somerville
Muhlebach Bros., Batesford, Ayrshire (0).										
Retreat Ada	24246	6.1.33	7	3,650	4·52	164·82	230	Jr. 2	.. ..	Wattle Park Bonnie Doon
Muhlebach Bros., Batesford, Jersey (0).										
Golden Girl of Wattle Bank	17811	26.2.33	21	6,783	4·92	333·49	350	Mature	339, 373, 320	Pansy's Eminent of Rosemont
Nancarrow Bros., Kerang, Jersey (0).										
Bellaire Duchess ..	28585	26.1.33	N.O.C.	6,537	5·17	338·23	350	Mature	.. ..	Prince of Bellaire
Nicholas, A. M., Shoreham, Jersey (1).										
Retford Magenta	11467	17.3.33	30	7,850	5·73	449·48	350	Mature	511 ..	Prometheus (Imp.)
Jubilee Wygelia ..	C.R.	23.3.33	12½	4.362	5·11	222·83	230	Jr. 2	.. ..	Jubilee Asterlight
Nicholas, A. M., Sherbrooke, Jersey (1).										
Jubilee Montbretia ..	C.R.	6.3.33	18	5,626	4·79	269·26	230	Jr. 2	.. ..	Jubilee Asterlight
Noble and Son, T. M., Maffra, Jersey (1).										
Finchley Nasturtium ..	39743	24.1.33	19	6,947	5.45	378·62	230	Jr. 2	.. ..	Werribee Lord Burnham
Nolte, E. H., Merino, Jersey.										
Nairana Kitty	29241	29.3.33	..	6,965	4.51	314.27	350	Mature	408 ..	Garanties Colonel of Penrhyn
Onley, W. H., Caldermeade, Ayrshire (0).										
Holm Poppy	23000	2.1.33	18½	3,993	4.78	190·73	230	Jr. 2	.. ..	Pride of Thirlmere
Holm Brilliance	20347	11.1.33	10	4,508	4.11	185·08	330	Sr. 4	207, 257 ..	Pride of Thirlmere
Holm Laurel	21782	27.1.33	7½	3,249	4.22	137·14	270	Jr. 3	320 ..	Pride of Thirlmere
Holm Laurette	20349	16.2.33	15	6,425	3.62	232·88	310	Jr. 4	216, 283 ..	Pride of Thirlmere
Holm Boronia	20346	18.2.33	14½	4,880	4.69	228·94	330	Sr. 4	218, 267 ..	Pride of Thirlmere
*Holm Bunty	18281	15.3.33	4	4,395	5.07	222·78	350	Mature	239, 236, 263	Pride of Thirlmere
Orchard, Mrs. L., Grahamvale, Jersey (0).										
Pearl of Jersey Vale ..	15581	5.3.33	8½	3,697	4.59	169·78	350	Mature	220, 239, 202, 220, 285, 311, 277	Choice II. of Tarnpirr
Jersey Vale Lassie ..	C.R.	20.3.33	11½	3,768	4·92	185·50	350	Mature	231, 323, 308, 338	Princess 2nd's Twylish of Grangelea
Overend, Mrs. A. C., Sale, Jersey (0).										
Bon Accord Island Gem ..	25576	7.1.33	13½	4,178	5·43	227·02	350	Mature	271, 270, 367, 427	Lord Island Fancy of Brucevale
Bon Accord Pompadour 3rd	C.R.	11.1.33	14	3,594	5·60	201·38	230	Jr. 2	.. ..	Bon Accord John
Bon Accord Madam Pompadour 2nd	38009	14.1.33	14½	3,989	5·30	211·25	250	Sr. 2	280 ..	Bon Accord David
Waratta Emma Bell ..	23505	5.2.33	19½	4,901	5·85	286·77	350	Mature	314, 324, 348, 380	Jubilee Lifelight
Bon Accord Bright Spark..	C.R.	22.2.33	16	4,016	4·88	196·10	230	Jr. 2	.. ..	Bon Accord John
Bon Accord Brilliant Gem..	38008	26.2.33	13½	4,293	5·36	229·93	290	Sr. 3	262, 411 ..	Bon Accord David
Bon Accord Maggie ..	38010	12.3.33	12	4,262	5·24	223·12	250	Sr. 2	294 ..	Bon Accord John
Bon Accord Belle ..	33576	22.3.33	13	5,130	5·62	288·38	310	Jr. 4	293, 335 ..	Bon Accord David
Padgett, I., Werribee, Friesian (1).										
St. Alban's Lady Echo ..	2292	11.2.33	31	12,503	3.53	441.26	350	Mature	545 ..	Eco Sylv King Pontiac
Pattison, F., Tongala, Ayrshire (0).										
Willow Park Fairy ..	22241	26.1.33	16	6,000	4·32	258·97	330	Sr. 4	260, 266 ..	Clansman of Glenholm
Willow Park Pearl ..	22243	11.2.33	14	6,938	4·40	304·95	310	Jr. 4	260, 318 ..	Clansman of Gleneira

*240 days in test.

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Pearce, W. H., Eurack, Jersey (1).										
Lovely Banks Pansy		1.3.33	8	4,022	4·99	218·14	230	Jr. 2	.. ..	Pansy's Twylish of Colac
Lucerne Vale Twylish Trixie	25351	2.3.33	14½	6,306	5·42	341·63	330	Sr. 4	312 ..	Eurack Twylish Chief
Pearson, J., Nerrena East, Jersey (0).										
Warrawee Tulip	C.R.	6.2.33	N.O.C.	4,328	5·04	218·14	230	Jr. 2	.. ..	Banyule Tympani
Pestell, W. M., Seymour, Jersey (0).										
Greenwood Carrie ..	37813	11.3.33	9	2,891	5·92	171·06	290	Sr. 3	.. ..	Greenwood Edwin
Greenwood Cassandra ..	37814	20.3.33	..	4,572	5·03	230·04	290	Sr. 3	.. ..	Greenwood Emperor
Greenwood Clementine 2nd	37818	21.3.33	..	4,849	5·22	253.10	290	Sr. 3	.. ..	Greenwood Emperor
Phillips, J., Murrayvale, Jersey (0).										
Peri Vanilla 5th ..	C.R.	31.1.33	20½	4,643	4·87	226·30	230	Jr. 2	.. ..	Royal Rover of Lea Hurst
Peri Carnation 3rd ..	26130	7.2.33	18	5,663	4·80	272·03	350	Mature	207, 233, 236, 274	Carnation Bosun
Phillips, J. H., Swan Hill, Jersey (1).										
Kantara Musk	26202	28.1.33	21	8,070	5·40	436·07	350	Mature	330, 370 ..	Kantara Great Gun
Plattfuss, J., Tongala, Friesian (1).										
*Greenvale Springfield Dekol	Vol. 12	11.2.33	4	6,870	3·76	258·42	290	Sr. 3	278 ..	Victoria Double Oak De Koll
Greenvale Duchess Paxton	2768	22.2.33	30	12,807	3·28	419·44	350	Mature	325, 466, 440, 450, 394	Lydholme Segis Paxton
Greenvale Oakwood Flower	Vol. 12	27.2.33	17½	5,970	3·04	181·62	250	Sr. 2	.. ..	Dominion Oakwood
Pollard, Chas., Wodonga, Jersey (2).										
Bonegilla Azalea ..	33614	2.1.33	12	5,247	6·17	323·48	290	Sr. 3	.. ..	Valiant Prince of Glen Iris
Bonegilla Jonquil ..	38053	24.1.33	19½	5,444	5·90	321·05	250	Sr. 2	.. ..	Springhurst Byron
Poole, Mrs. M. A., Caldermeade, Ayrshire (0).										
Ryeland's Stella ..	20719	11.2.33	26	7,145	3·89	277·67	310	Jr. 4	254 ..	Baron of Glen Afton
Ryeland's Princess 2nd ..	C.R.	27.2.33	16½	3,843	4·19	161·03	250	Sr. 2	.. ..	Roseleigh Bruce
Ryeland's Pride 2nd ..	C.R.	28.2.33	13½	3,477	4·18	145·21	250	Sr. 2	.. ..	Roseleigh Bruce
Ryeland's Princess ..	C.R.	26.3.33	N.O.C.	3,895	4·49	174·93	310	Jr. 4	.. ..	Ryeland's Baron Boronia
Powell, Mrs. K., Camperdown, Jersey (0).										
Mount Violet Starlight ..	33628	18.2.33	15	3,972	5·71	226·98	330	Sr. 4	240, 380 ..	Chief of Allambie
Purss, F. W., Walwa, Jersey (0).										
Willow View Petal's Pride	38086	13.2.33	20	4,050	5·35	216·87	230	Jr. 2	.. ..	Springhurst Numa
Raleigh, Miss H. E., Pakenham Upper, Jersey (0).										
Burnside Gavotte ..	24558	2.1.33	13½	5,560	6·27	348·51	350	Mature	341, 246, 284, 301	Retford Lord Twylish
Ralph, A. and R., Moorabbin, Illawarra Shorthorn (3).										
Fussy 6th of Allawalla ..	14333	23.1.33	11	10,043	4·16	418·20	350	Mature	322 ..	Premier of Fairfield
*Parkview Blossom 4th ..	5081	8.2.33	..	9,435	4·13	389·25	250	Sr. 2	311 ..	Jean's Monarch of Blacklands
†Parkview Fussy 32nd ..	Vol. IV.	7.3.33	..	7,710	4·26	328·62	250	Sr. 2	.. ..	May flower's Repeater of Hill View
Rankin, W. J., Trafalgar, Jersey (1).										
Brookfield Sunshine 13th	38453	23.3.33	25½	8,495	4·58	389·37	330	Sr. 4	227, 340 ..	Werribee Wyandotte's Star
Read, J. D., Springhurst, Jersey (4).										
Nardoo of Springhurst ..	18936	22.3.33	21	8,547	5·92	506·24	350	Mature	301, 458, 386, 553, 618, 674	Starbright's Prince of Glen Iris
Springhurst Alsyke 4th ..	29329	25.3.33	18½	8,052	6·38	513·82	330	Sr. 4	303, 406, 456	Starbright's Prince of Glen Iris
Gladiolus 2nd of Springhurst	18929	25.3.33	21	8,303	5·98	496·69	350	Mature	401, 487, 445, 457, 528, 623	Starbright's Prince of Glen Iris
Springhurst Melitat 3rd ..	26167	25.3.33	16	6,816	5·99	408·02	330	Sr. 4	324, 389, 545	Starbright's Prince of Glen Iris
Rechenberg, J. F., Marshall, Ayrshire (3).										
Gala Gain 2nd	21435	18.2.33	23	7,845	4·55	356·77	350	Mature	.. ..	Sparrovale Ulysses
Camelot Doreen	22578	18.2.33	13	6,668	5·11	340·63	310	Jr. 4	.. ..	Sparrovale Ronald
Sparrovale Bangle ..	16638	15.3.33	15	7,377	3·87	285·19	350	Mature	.. ..	Alpha of Sparrovale
Camelot Necklet	24668	19.3.33	21½	7,076	4·02	284·13	270	Jr. 3	.. ..	Scotswood Adonis Earl
Reid, Miss B. B., Bundoora, Jersey (0).										
Comely Banks Wattle ..	23387	27.1.33	18	5,261	5·17	272·17	350	Mature	.. ..	Lily's Lad of Holmwood
Jubilee Cowslip	C.R.	16.2.33	18	4,204	5·29	222·24	230	Jr. 2	.. ..	Jubilee Asterlight
Jubilee Dampieras ..	40424	19.2.33	14½	3,867	5·49	212·42	250	Sr. 2	.. ..	Jubilee Wheatenlight
Richardson, W. S., Bacchus Marsh, Jersey (1).										
Silvermine 34th of Banyule	18813	27.1.33	17	5,385	5.41	291·26	350	Mature	281, 349, 231, 307, 329	Matador of Banyule
Sutton Lea Patricia ..	26438	28.1.33	24	7,739	5·91	457·03	350	Mature	285, 250, 313	Lady Lottie's Prince of Belgonia

* 240 days, tests discontinued. † 210 days in test.

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Rodda, W. G., Warracknabeal, Jersey (2).										
Banyarra Attraction ..	34075	14.1.33	17½	5,634	5·99	337·66	270	Jr. 3	352 ..	Marc Anthony of Aveley
Banyule Princess 3rd ..	24463	2.2.33	19½	7,086	5·58	395·58	350	Mature	278, 505 ..	Air Lord of Banyule
Thurso Molly Pet ..	C.R.	19.2.33	5½	2,581	4·97	128·20	230	Jr. 2	.. ..	Superstrain of Banyule
Sweet Lass 2nd of Clover Flat ..	21411	24.2.33	16½	6,199	5·54	343·54	350	Mature	439 ..	Beauty's Lad
Ronalds, O., Tarago, Jersey (1).										
Glenwood Fancy	40014	2.3.33	22½	7,130	5·74	409·15	290	Sr. 3	.. ..	Lady Choice's King 2nd of Glenwood
Runciman, C. M., Murraydale, Jersey (2).										
Bideford Magnolia ..	38912	16.3.33	15½	5,198	5·70	296·21	250	Sr. 2	.. ..	May's Twylish of Jersey Vale
Bideford Cream Stockings	26218	24.3.33	19	7,031	5·56	390·59	350	Mature	350, 308 ..	Beverley Lord
Ryan, D. M. and Sons, Colac, Illawarra Shorthorn (0).										
Nobby of Fairfield ..	16502	2.1.33	N.O.C.	5,366	4·44	238·48	310	Jr. 4	263, 264 ..	Fussy's Pride of Fairfield
Basin Banks Fussy ..	Vol. 4	17.1.33	17	5,927	3·42	202·91	230	Jr. 2	.. ..	Redman of Glenburn
Salesian College, Sunbury, Ayrshire (0).										
*Rupertswood Rosella ..	22060	12.1.33	4	5,288	4·44	234·71	290	Sr. 3	320 ..	Lancer of Rupertswood
Schlipalius, A. J., Kilmany South, Jersey (0).										
Fairbank Duchess ..	24596	5.3.33	9	3,894	5·83	226·85	350	Mature	271, 281, 368	Gaylad of Fairbank
Simpson, T. E. and Son, Lower Ferntree Gully, Jersey (1).										
†Kantara Starbright ..	Vol. 20	6.3.33	N.O.C.	6,531	5·64	368·09	230	Jr. 2	.. ..	Kuku Fashion Plate
Smith, E. L. and Sons, Woodend, Friesian (1).										
Homeleigh Oliveleaf ..	Vol. 12	1.1.33	25½	7,778	3·68	285·88	230	Jr. 2	.. ..	Homeleigh Oakfield
Stephens, Dr. F. G., Vermont, Jersey (0).										
Clarendon Eyre Camille 2nd	33940	24.1.33	19	4,835	5·02	242·63	310	Jr. 4	342, 385 ..	Eminent's Achievements of Clarendon Eyre
Stoll, Mrs. L. T., Rokeby, Jersey (0).										
Clarendon Eyre Pretty Peggy	29627	26.1.33	19½	4,832	4·41	213·18	350	Mature	201, 250, 317	Rose's Eminent of Clarendon Eyre
Clover Bank Pretty Peggy	C.R.	27.3.33	18½	4,349	4·29	186·71	230	Jr. 2	.. ..	Cloverbank Lord Twylish
Stoney, W. B., Drouin West, Jersey (0).										
Edmonton Trixie's Lass 2nd	33215	11.2.33	12	3,200	6·19	197·93	270	Jr. 3	278 ..	Rarius of Edmonton
Tarago Wildflower ..	C.R.	18.2.33	17	3,845	4·73	182·06	230	Jr. 2	.. ..	Glenesk Eminent's Lightnin 2nd
Sutton and Son, Callignee, Jersey (0).										
Omatoroa Mayflower ..	C.R.	2.2.33	N.O.C.	3,749	5·02	188·25	230	Jr. 2	.. ..	Wattle Bank Eminent's Chief
Tomasetti, B. G., Drouin West, Ayrshire (4).										
Glencorren Bonnie Belle ..	20118	16.1.33	26	6,740	4·86	327·49	310	Jr. 4	299 ..	Bell Boy of Oakbank
Glencorren Lilac ..	22832	13.2.33	29	7,637	4·94	377·51	270	Jr. 3	393 ..	Scotswood Michael 2nd
Leithvale Ella	20465	26.2.33	22	7,464	4·81	358·98	330	Sr. 4	292, 346 ..	Gleneira Grantham
Glencorren Bellbird ..	24953	28.2.33	22	6,473	4·00	258·65	230	Jr. 2	.. ..	Scotswood Michael 2nd
Glencorren Nellie Ray ..	21507	9.3.33	18	7,635	4·05	309·54	310	Jr. 4	266, 300 ..	Federal of Warrook
Unthank, J., Somerville, Jersey (1).										
Moorooduc Champagne ..	C.R.	26.1.33	10	3,459	6·15	212·64	230	Jr. 2	.. ..	Moorooduc Silver King
Moorooduc Queenie ..	33859	29.1.33	24	6,173	5·88	362·73	310	Jr. 4	326, 392 ..	Moorooduc Repulse
Vagg, E. J., Leongatha, Jersey (2).										
Lady of Queen's Vale ..	19963	19.1.33	17	6,188	5·69	352·29	350	Mature	431, 451, 452, 488, 462	Daphne's Peer of Queen's Vale
Golden Pansy of Welbourne	21721	9.2.33	28	7,199	5·09	366·36	350	Mature	359, 397, 433, 457	Beauty's Prince of Somerville
Van Brummelen, J. K., Ferntree Gully, Friesian (2).										
Bolero Rose Marie ..	3360	28.1.33	43	9,333	3·10	288·96	350	Mature	370, 336 ..	Burnbank Inka Sylvia's Lad
Bolero Rose	C.R.	28.1.33	35½	7,724	3·29	254·37	230	Jr. 2	.. ..	St. Alban's Queens Korndyke 2nd
Bolero Inka Blanchje ..	3352	2.3.33	33½	8,984	3·87	347·72	310	Jr. 4	312, 343 ..	Burnbank Inka Sylvia's Lad
Vaughan Bros., Girgaree, Jersey (2).										
Lynroy Holly	C.R.	2.2.33	18	5,052	5·10	257.76	230	Jr. 2	.. ..	Sherbourne Wyandotte's King
Lynroy Opal	C.R.	5.3.33	13½	5,179	6·02	311·54	270	Jr. 3	.. ..	Sherbourne Wyandotte's King
Walker, C. S., Swan Hill, Friesian (1).										
Burnbank Maggie Alcartra ..	3392	28.2.33	15½	11,906	3·25	387·16	350	Mature	327 ..	King Alcartra Netherland
Wallace, A., Bendigo, Ayrshire (0).										
Glen Cooee Vista ..	23829	10.2.33	11½	4,931	4·54	223·97	250	Sr. 2	.. ..	Fairy Prince of Glen Cooee

* 210 days in test. † 240 days in test.

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Wallace, A., Bendigo, Jersey (2).										
Preston Wattle Bloom ..	33884	28.12.32	23	7,160	4·95	354·24	310	Jr. 4	321, 356 ..	Kyora Mayflower's Fancy
Myall Snowflake ..	26422	28.1.33	14	5,634	5·17	291·09	350	Mature	.. ..	Preston Pretty Maid's King
Preston Sun Blossom ..	38500	6.2.33	16½	6,424	4·85	311·31	270	Jr. 3	256 ..	Preston Pretty Boy
Preston Maybelle ..	36970	27.2.33	19½	6,432	4·97	319·64	350	Mature	.. ..	Kyora Mayflower's Fancy
Warragul High School, Warragul, Red Poll (2).										
Gipps Barbara	3120B	2.1.33	18	5,297	4·34	229·71	230	Jr. 2	.. ..	Woodburn Laureate
Gipps Marie	2878A	17.1.33	13	5,642	4·28	241·22	230	Jr. 2	.. ..	Woodburn Laureate
Gipps Thera	2188A	20.2.33	17	5,888	4·33	254·84	330	Sr. 4	262, 211 ..	Woodburn Laureate
Gipps Fiona	2388B	24.3.33	20	8,013	4·29	343·68	310	Jr. 4	287 ..	Woodburn Laureate
Watts, J. S., Stanhope, Jersey (3).										
Kantara Trethella's Jenny	26204	7.1.33	23	7,866	6·95	546·85	350	Mature	534, 532, 521	Ku Ku Fashion Plate
Model of Ballara ..	19000	14.2.33	33½	9,758	5·77	562·75	350	Mature	393, 448, 595, 619, 555, 581	Werribee Madeira Cream's Masterpiece
Langi Rosebud ..	29593	21.2.33	21	7,184	5·92	425·71	330	Sr. 4	316, 311, 429	Welcome Nugget of Aberdour
Webb, H. L., Sunbury, Ayrshire (0).										
Holly Green Rosa ..	20342	20.2.33	12	4,944	4·10	202.47	310	Jr. 4	257, 255 ..	Lily's Goldmine of Holly Green
Holly Green Quiver ..	18276	6.3.33	13½	4,581	4·14	189.44	350	Mature	166, 205, 216, 219	Headlight of Holly Green
Holly Green Queenhood ..	18274	11.3.33	27½	6,392	3·84	245·53	350	Mature	269, 339 ..	Holly Green Masher
Holly Green Alva ..	25116	13.3.33	14½	4,212	3·38	142·34	230	Jr. 2	.. ..	Holly Green Gold Coin
West, J. C., Notting Hill, Illawarra Shorthorn (7).										
Grange Lea Pearl ..	8198	1.1.33	19½	5,729	4·14	237·23	230	Jr. 2	.. ..	Greyleigh Archer
Parkview Tot	Vol. 3	27.1.33	35	9,053	4·12	379·56	270	Jr. 3	414 ..	Jean's Monarch of Blacklands
Nellie 7th of Kurrawong ..	11887	1.2.33	25	7,784	4·04	314·27	290	Sr. 3	.. ..	Merry Count of Berry
Grange Lea Topsy ..	8200	19.2.33	18	5,705	3·75	213·79	230	Jr. 2	.. ..	Egbert of Allawalla
Grange Lea Rosie ..	8199	27.2.33	6½	6,021	3·90	234·57	230	Jr. 2	.. ..	Magic of Alne Bank
Grange Lea Lucy ..	8197	1.3.33	20½	6,686	4·22	282·17	230	Jr. 2	.. ..	Greyleigh Archer
Grange Lea Florrie ..	8196	5.3.33	24½	8,429	4·18	352·60	230	Jr. 2	.. ..	Spearfelt of Alne Bank
Grange Lea Clara ..	8195	11.3.33	20	6,782	4·10	277·98	230	Jr. 2	.. ..	Magic of Alne Bank
White, Russell, Cardigan, Ayrshire (0).										
Sparrovale Balm ..	16637	28.1.33	16	5,388	4·54	244·82	350	Mature	193 ..	Alpha of Sparrovale
Madge of Drayton ..	7256	5.2.33	32	9,374	3·58	335·68	350	Mature	.. ..	Blue Bob of Glengowrie
Williams, F. A., Bamawm Extension, Jersey (1).										
Bamawm Mascot ..	38528	17.2.33	13	4,274	6·47	276·50	230	Jr. 2	.. ..	Mornmoot Starbright King
Wilson, D. C., Derrinallum, Jersey (0).										
Ayton Law Noble Silvie 3rd	C.R.	15.1.33	10½	3,711	5·43	201·58	230	Jr. 2	.. ..	Wagga Yambil's Goddington Noble
Ayton Law Silvie's Girl 2nd	33923	8.3.33	6½	3,785	5·50	208·31	290	Sr. 3	249 ..	Wagga Yambil's Goddington Noble
Brightside Bessie ..	29472	17.3.33	14	4,841	5·14	248·59	350	Mature	288, 313 ..	Royal Gem of Somerville
Wood, C. J., Frankston, Jersey (0).										
Maitland's Petal of Clyde Vale	21246	19.2.33	12	5,790	5·18	299·67	350	Mature	382, 392, 332	Marmion of St. Johns
Wood, J. V. M., Heidelberg, Jersey (4).										
Clarendon Eyre Belladonna	33939	28.12.32	25	8,642	6·09	526·59	310	Jr. 4	420, 475 ..	Eminent's Achievement of Clarendon Eyre
Clarendon Eyre Waltz Dream	33953	10.1.33	26	8,115	5·50	446·66	310	Jr. 4	368, 452 ..	Eminent's Achievement of Clarendon Eyre
Clarendon Eyre Pinafore 3rd	33947	23.1.33	20½	7,898	5·84	461·51	270	Jr. 3	362 ..	Eminent's Achievement of Clarendon Eyre
Clarendon Eyre Utopia ..	29628	26.3.33	15	6,513	5·89	383·49	310	Jr. 4	444, 432 ..	Eminent's Achievement of Clarendon Eyre
Woodmason, W., Oakleigh, Jersey (4).										
Melrose Jessie 49th ..	25702	2.1.33	21½	6,878	5·32	365·80	350	Mature	227, 357, 380	Sunset of Melrose
Melrose Lassie Fowler 18th	38573	9.1.33	23	6,306	5·96	376·11	270	Jr. 3	358 ..	Melrose Clementine 2nd's Masterpiece
Melrose Lassie Fowler 17th	33963	10.1.33	15	4,794	6·45	309·04	310	Jr. 4	274, 360 ..	Masterpiece
Melrose Graceful Duchess 41st	23532	16.1.33	16½	6,302	5·64	355·30	350	Mature	201, 354, 380, 407, 374	Sunset of Melrose
Xavier College, Kew, Jersey (2).										
*Marguerite of Paradise ..	17452	1.1.33	4	3,690	4·90	180·72	350	Mature	304, 391 ..	Werribee Northern Larkspur's Fancy
Gowan Lea Three Star ..	28892	20.1.33	19	5,580	5·66	315·71	310	Jr. 4	... ..	Mill Orion
†Melview Queen 6th ..	C.R.	17.2.33	4	2,400	6·27	150·48	230	Jr. 2	.. ..	Handsome Boy 12th of Jerseyholm
Xavier Edith	C.R.	3.3.33	20	5,856	5·78	338·21	230	Jr. 2	.. ..	Grangelea David

* 210 days in test. † 180 days in test.

TESTED SIRES

Hereunder is a list of sires one or more of whose progeny in the test for the quarter ended 31st December last yielded 100 lb. butter-fat in excess of that required to qualify for certificate. The quantity of butter-fat required for certificate in the various classes plus the additional 100 lb. is indicated at the top of the several columns, and the figures shown opposite the name of each sire are the yields of butter-fat from individual heifers or cows by that sire.

Name of Sire.	Breed.	Class.						
		Jr. 2 330 lb.	Sr. 2. 350 lb.	Jr. 3. 370 lb.	Sr. 3. 390 lb.	Jr. 4. 410 lb.	Sr. 4. 430 lb.	Mature and over 450 lb.
Ballara His Majesty	..	..	..	395				
Banyule Aeronaut	Jersey	377						
Beleura Sarchedon	Ayrshire	..	..	409				
Burnbank Inka-Sylvia Lad	Friesian	..	..	485				
Choice Prince of Belgonia	Jersey	..	..	..	418			
Eminents Achievement of Clarendon Eyre	Jersey	..	..	462	..	527 447		
Federal of Warook	Ayrshire	..	..	..	..	..	..	493
Fulham Future	Ayrshire	..	..	..	..	411		
Gadabout-of-Danton	Jersey	..	..	..	..	..	..	495
Glengowrie Poitrel	Ayrshire	332						
Goddington Winks 6th (imp.)	Jersey	..	..	..	..	..	..	528
Goldstar of Strathbow	Jersey	..	..	..	409			
Hedge of Banyule	..	..	..	432				
Heroic of Somerville	..	..	..	..	..	..	..	621
Jeans Monarch of Blacklands	Illawarra Shorthorn	..	389	373				
Kantara Don Juan	Jersey	347						
King 3rd of St. Albans	Jersey	..	..	..	..	..	..	571
Ku Ku Fashion Plate	Jersey	368	..	..	..	..	..	547
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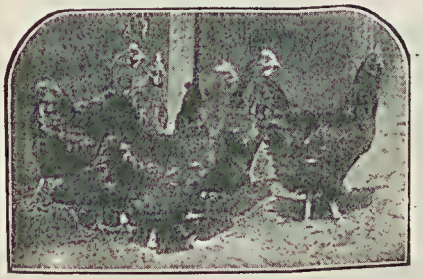

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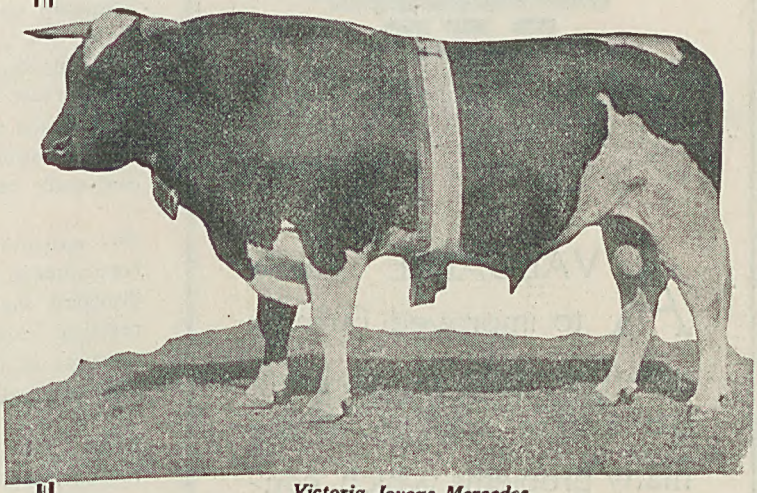

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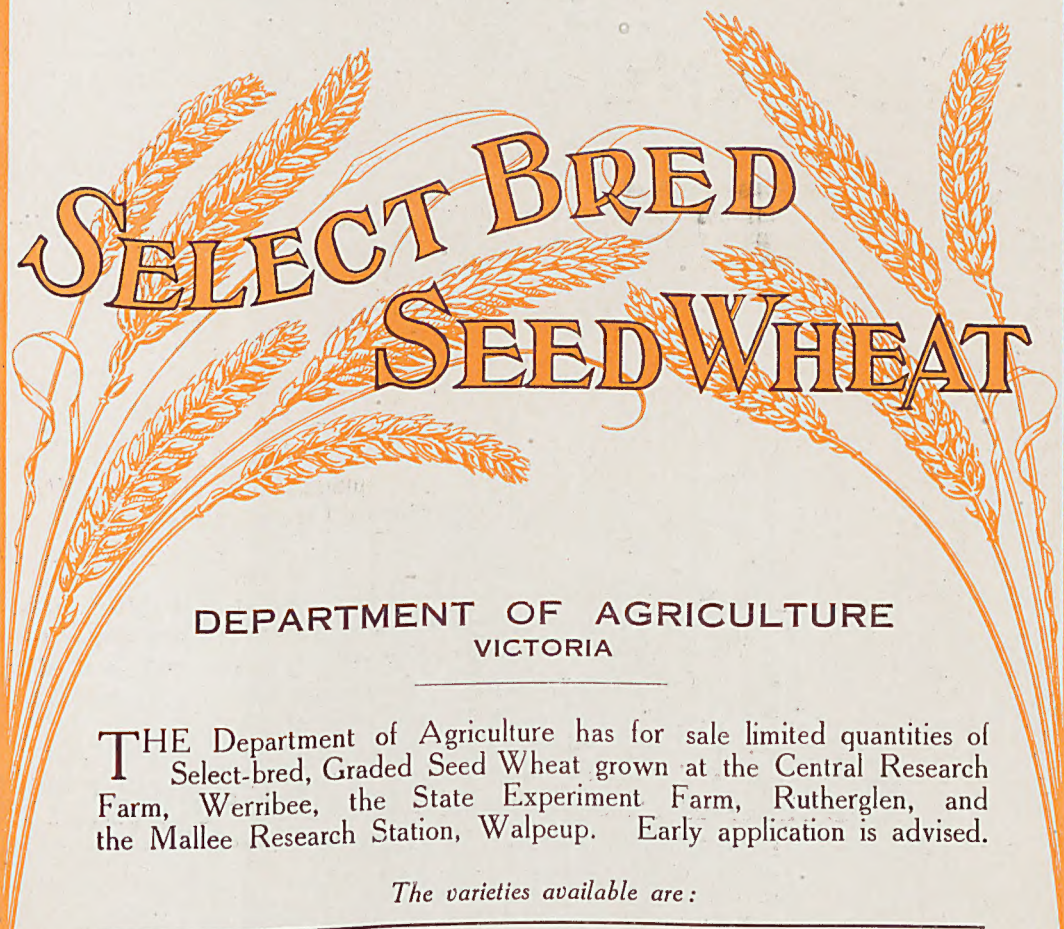

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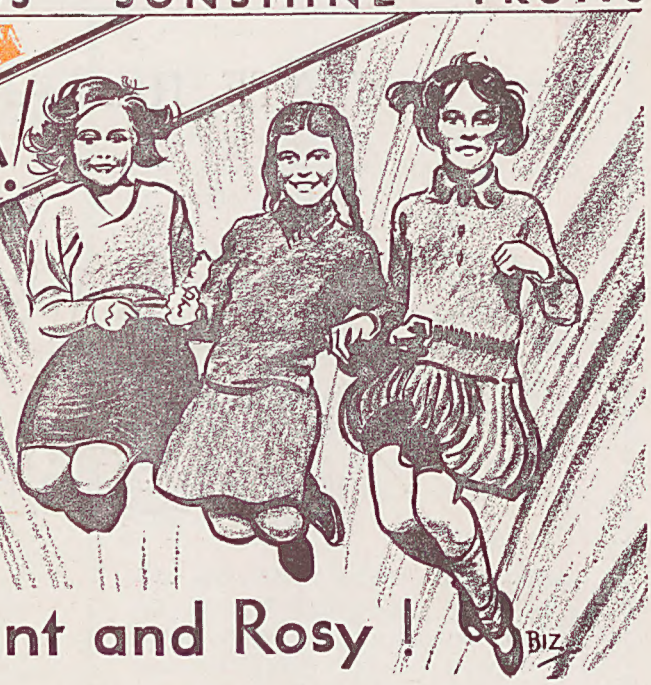

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